EXHIBIT 9

IN UNITED STATES DISTRICT COURT
DISTRICT OF DELAWARE

BRIDGESTONE SPORTS CO., LTD., and BRIDGESTONE GOLF, INC., *Plaintiffs,* *v.* **ACUSHNET COMPANY,** *Defendant.*	C.A. No. 05-132(JJF) DEMAND FOR JURY TRIAL

EXPERT REPORT OF LARRY C. CADORNIGA

H. The Expert Report of Dr. Ed Caulfield, including the testing data and testing protocols contained therein. I was also involved in establishing testing protocols to test and measure various properties of the accused golf ball. To this end I worked together with Dr. Ed Caulfield and met with him and his staff at his test facilities in Naperville, Illinois. I have reviewed Dr. Caulfield's testing protocols and procedures for each of the tests performed. In addition, I have personally witnessed testing performed in accordance with Dr. Caulfield's testing protocols during a visit to his laboratory. Based on my 30 years of experience in the golf industry, it is my opinion that protocols employed were appropriate and that it is reasonable to rely on Dr. Caulfield's test results. This is the type of testing I have in the past and would in the future rely on in my professional capacity as a golf ball designer and engineer. I further agree that the number of samples of the accused Acushnet golf balls tested is more than sufficient to comprise a statistically significant sample.

IV. SUMMARY OF THE ACCUSED ACUSHNET GOLF BALLS

It is my understanding that a number of golf balls manufactured and sold by Acushnet have been accused of infringing the Bridgestone patents-in-suit. It is also my understanding that there are multiple versions, known in the golf ball industry as sidestamps, of each model of accused Acushnet golf ball. Table MR-1 summaries my understanding of the different sidestamps of the accused Acushnet golf balls.

LARRY C. CADORNIGA

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(C/V: Larry C. Cadorniga/January 11, 2007)

ACCOMPLISHMENTS AND WORK BACKGROUND:

DBA / LCC CONSULTING: (July 1995 to Present)

May 2002 to Present
Expert golf ball consultant to Radar Golf, Inc., subsequently, retained as Chief Technology Officer. Develop, design and introduce the RF technology into the golf ball for "findability" in conjunction with a hand-held device

Oct. 2003 to Aug. 2004
Expert Golf Ball Consultant to Gibson, Dunn &Crutcher, LLP.
Reviewed and advised the law firm on golf ball technology litigation.

Dec. 2002 to May 31, 2005
Expert Golf Ball Consultant to the United States Golf Association.
Assist the USGA in the golf ball studies of the effects of the different constructions and physical properties to the performances of golf balls. .

June, 2002 to Jan. 2003
Expert Golf Ball Consultant to Knobbe, Martens & Associates, Irvine, CA
Reviewed and advised the law firm on golf ball patent litigation. Contact is Atty. Paul Tripodi III.

Feb. 2001 to June, 2002 (Re-hired March, 2004 to Present)
Expert Golf Ball Consultant to Sughrue, Mion & Associates, Wash. D. C.
Review and advised the law firm on golf ball patent litigation, process, quality control and product testing procedures.

August 1999 to present **R & D Consultant to Fantom Golf Limited, Korea/China**
Consult and assist the product development team.
Fanton Golf is primarily an OEM golf ball manufacturer who custom design golf ball products for private brands of golf balls marketed globally, mostly in the USA and Japan. Awarded two golf ball US patents.

(continuation: C/V for Larry Cadorniga)

July 1995 to June 2002 **Gen. Manager/Consultant to Golf Tech Systems, Ltd., ROC**
Total project responsibility in starting a new facility to manufacture golf balls. Planned and scheduled equipment design/purchase, general floor layout, product process flow, installations, debug, maintenance, operating procedure, etc., while providing all the product design technology involving chemical compositions and aerodynamic design for optimum performances.

Successfully developed and introduced the following golf ball products:

Exacta Tour Evolution	Exacta Extra Spin
Exacta 432 Professional	Exacta 432 Control
Exacta 432 Performance	Exacta Distance
Bald Eagle Tour/Spin	LCC Tour Hi Performance
LCC Tour Control	Top Ace
Triton Tour/Performance	Triton TLB
Intech / Titech Titanium	Arnold Palmer (Europe)

(all are USGA approved conforming golf balls)

April 1996 to July 1998 **R & D Consultant to Bobby Grace Golf Designs by Cobra Golf, Calsbad, Ca.**
Developed/designed elastomeric rubber compositions for golf putter face inserts to improve the general performances on feel and sound especially when a player is using a two piece construction golf ball.

Awarded one patent: (a second patent pending)
U S Patent no. 5,924,939 – "Golf Club Head with a Strike Face Having a First Insert With In a Second Insert"
Successfully developed and introduced several models of Bobby Grace putters with inserts with overwhelming acceptance. The insert is known as "HSM":

Bobby Grace AN7 HSM	Bobby Grace Little Man HSM
Bobby Grace the 2200 HSM	Bobby Grace Pip Squeek HSM
Bobby Grace KBI HSM	Bobby Grace by Cobra Payday HSM
Bobby Grace Low Pro HSM	Bobby Grace by Cobra Soft Lady

March 1989 to July, 1995 **DUNLOP SLAZENGER CORP. - Maxfli Golf,** GREENVILLE SC
Positions Held: Director, Research and Development
Manager, Product Development
I managed the Research and Development Department, consisting of professionals and non-exempt associates, totaling 14 people, in supporting the company strategies. Participated as Company Board Member to plan, control, and guide the company in ultimately achieving its goals.

(continuation: C/V for Larry Cadorniga)

Awarded Ten US Patents and Designs assigned to DSC:

Patent no. 5338083 Golf Ball Design	Patent no. D355943 Dimple Design
Patent no. 5321089 Golf Ball Cover	Patent no. 550795 Foamed Club
Patent no. 5415937 Golf Ball Cover	Patent no. 5580350 Core Cpd.
Patent no. 5470076 Dimple Pattern	Patent no. 5538794 Golf Ball Cover
Patent no. 5465969 Rubber Cpd.	Patent no. 5497996 Golf Balls

Successfully developed, introduced, manufactured following golf equipment:

Maxfli CD golf ball	Maxfli MD Golf balls
Maxfli MD(variable speed)	Maxfli HT Tour Balata golf ball
Maxfli HT Hi-Spin golf ball	Maxfli VHL Golf club set
Dunlop DDHIII golf ball	Dunlop DDH IV golf ball
Dunlop DDH Distance	Dunlop DDH Accuracy golf ball

Nov. 1986 to Mar. 1989 **Acushnet Company / Titleist Golf Div., Fairhaven, MA**
Position Held: Manager of Product Engineering
I managed the Product Engineering Team consisting of professionals and non-exempt employees, totaling 8 people, in supporting company goals in new product development.

Awarded two US Patents assigned to Acushnet Co.

Patent no. 5020803 Golf Ball	Patent no. 4995613 Rubber Composition

Successfully developed, introduced, and manufactured the following golf balls:

Titleist Tour Balata	Pinnacle Gold

May 1980 to Nov. 1986 **MacGregor Golf Company, Albany Georgia**
Positions Held: Director, Golf Ball Operations
Manager, Golf Ball Operations
Senior Chemist, R &D
I managed Golf Ball Operations, consisting of 60 personnel, producing about 500,000 dozen golf balls annually, while directing R&D efforts, as well.

Awarded two US Patents assigned to MacGregor
Patent no. 4836552 Short (Cayman) Golf Ball
Patent no. 4830116 Method of Making the Cayman Golf Ball

Successfully developed, introduced, and manufactured the following golf ball products:

MacGregor Tourney	MacGregor MT	Nicklaus De+D
Nicklaus DC	Muirfield Balata	Cayman Golf

(continuation: C/V for Larry Cadorniga)

Aug. 1976 to May 1980 **Wilson Sporting Goods, River Grove, Illinois**
Positions Held: Manufacturing Manager
Manufacturing Supervisor
Rubber Technologist - R&D
I was instrumental in starting a tennis and racquetball manufacturing plant, along with four other key personnel. The factory successfully produced excellent products accepted for US Open play and replaced all other tennis ball sourced by Wilson. I developed rubber core compositions for golf balls and rubber compounds for tennis and racquetballs.

Feb. 1968 to Aug. 1976 **B. F. Goodrich Tire and Rubber Co., Manila, Philippines, Bearcat Tire Company and Salisbury Rubber Co., Chicago, Ill.** *Positions Held: Rubber Chemist* , Laboratory Assistant, Laboratory Technician.
I developed rubber compositions, performed raw material chemical tests and analysis, including product/process quality control.

Educational Background: Chemical Engineering Studies at the University of Santo Tomas, Manila, Philippines. Took several management courses and seminars in the USA. Completed the Quality Improvement Process Management and the Quality Education System course studies at the Philip Crosby Quality College in Atlanta, GA. Completed World Class Manufacturing Concepts and World class Statistical Thinking for Industry at the Tri-county State College, Anderson, SC.

Revised/ CV January 11, 2007)
Larry C. Cadorniga

EXHIBIT E

ACUSHNET'S INFRINGEMENT OF U.S. PATENT NO. 5,782,707

I understand that the Pro V1 golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶ are accused of infringing claim 1 of U.S. Patent No. 5,782,707. Based on all of the information I have considered and my experience, it is my opinion that all of these golf balls infringe this claim.

I. U.S. Patent No. 5,782,707

A. Summary

United States Patent 5,782,707 ("the '707 patent"), entitled *Three-Piece Solid Golf Ball*, issued on July 21, 1998. Messrs. Hisashi Yamagishi and Hiroshi Higuchi are the identified inventors of the inventions disclosed in the '707 patent.

The '707 patent relates to solid golf balls having increased flight distance on driver shots and improved control on approach shots. The golf ball of the invention contains a solid core, an intermediate layer, and a cover and achieves the above characteristics by various relative physical properties between the components of the golf ball.

B. Asserted Claim

I understand that Bridgestone is asserting claim 1 of the '707 patent. This claim reads:

> 1. A three-piece solid golf ball of the three-layer structure comprising a solid core, an intermediate layer, and a cover, having a plurality of dimples in the ball surface wherein
>
> the solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter wherein the core center hardness is up to 75 degrees, the core surface hardness is up to 85 degrees, the core surface hardness is higher than the core center hardness by 8 to 20 degrees, the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees, and the cover hardness is lower than the intermediate layer hardness by at least 5 degrees, and

the dimples occupy at least 62% of the ball surface.

C. Claim Construction Issues

I understand that the phrase "core center hardness," from claim 1 of the '707 patent, has been agreed by both Bridgestone and Acushnet to mean "the hardness measured at the center of the core." I also understand that the remainder of the words of the claim should be read according to their plain and ordinary meaning.

D. Accused Acushnet Golf Balls

I understand that Bridgestone is alleging that certain models and versions of the Pro V1 infringe claim 1 of the '707 patent. Specifically, I understand that balls having the sidestamps shown in Table E-1 are accused of infringing claim 1 of the '707 patent.

Accused Acushnet Golf Balls for Claim 1 of the '707 Patent		
Pro V1 392	Pro V1 392 (stretched)	◀Pro V1•392▶

Table E-1

As used in this Exhibit to my report, reference to the "Pro V1" golf balls refers to those golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶.

II. Infringement Analysis by Claim Term

A. "three-piece solid golf ball of the three-layer structure" (Preamble of Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls are three-piece solid golf balls having a three layer structure.

Based on my review, the accused Pro V1 golf balls have a solid core, a cover and a layer between the core and the cover.[1] Therefore, the balls are three-piece solid golf balls having a three layer structure.

B. "solid core" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a solid core.[2]

Additionally, it is my understanding that Acushnet has admitted that these balls have a core in response to Bridgestone's Requests for Admission Nos. 35, 63, 64, 65 and 66.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a solid core.

C. "intermediate layer" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have an intermediate layer.[3]

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[1] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

[2] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

[3] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

I understand from some of the documents produced and from various deposition testimony that this layer is also referred to as an "inner cover," "casing," or "mantle" layer within Acushnet. This does not change my opinion, as the layer is located between the cover and the core and is thus an intermediate layer as that term is used in the '707 patent and understood within the golf ball industry. This understanding is confirmed by documents produced by Acushnet in this litigation that refer to this layer as an "intermediate layer."[4]

Additionally, it is my understanding that Acushnet has admitted that these balls have an inner cover layer, which as discussed above is an intermediate layer, in response to Bridgestone's Requests for Admission No. 35.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have an intermediate layer.

D. <u>"cover, having a plurality of dimples in the ball surface" (Claim 1)</u>

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a cover with a plurality of dimples in the ball surface.[5]

Additionally, it is my understanding that Acushnet has admitted that these balls have a cover that covers the inner cover (*i.e.*, intermediate layer) in response to Bridgestone's Requests for Admission No. 35.

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[4] *See* AB 0087052, AB 0052058, AB 0086603-629, AB 0086687, AB 0015563-587, AB 0015471-497, AB 0086305-331, AB 0038214-232, AB 0038279-299, AB 0038761-62, AB 0038532-560, AB 0015563-587, AB 0015471-497 and Acushnet 30(b)(6) Depo. (Dalton) of July 20, 2006 at pp. 83 and 118-120.

[5] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a cover with a plurality of dimples in the ball surface.

E. "solid core, intermediate layer, and cover each have a hardness as measured by a JIS-C scale hardness meter wherein the core center hardness is up to 75 degrees" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a solid core, an intermediate layer, and a cover each of which has a hardness, and where the core center[6] hardness is up to 75 when measured on the JIS-C scale.[7]

Based on my review of testing data from Dr. Caulfield, and Acushnet documents, it is my opinion that each of the solid core, intermediate layer and cover have a hardness that is measurable on the JIS-C scale.

I have reviewed a sample of a Pro V1 golf ball bearing the sidestamp ◀Pro V1•392▶, the testing data from Dr. Caulfield, Acushnet produced documents, and Acushnet deposition testimony. Based on that review it is my opinion that the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶ have a hardness at the center of the core of up to 75 degrees JIS C. This data is summarized in Table E-2.

Sidestamp	Center JIS C Hardness
Pro V1 392*	63.3*
Pro V1 392 (stretched)*	63.3*
◀Pro V1•392▶	63.3

Table E-2

[6] Core center hardness is the hardness at the center of the core.

[7] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

Additionally, as shown in Acushnet's 2001 and 2002 Competitive Ball Reviews, Acushnet has measured the core center hardness of the Pro V1 392 version at 65 Shore C and the core center hardness of the ◀Pro V1•392▶ version at 62 Shore C.[8] I understand that there is no exact correlation between Shore C and JIS C measurements. However, based on my experience I understand these measurement methodologies provide similar numerical values for the same specimen. Thus, because the center of the golf balls measured by Acushnet had a Shore C hardness of 65 and 62, respectively, it is my opinion that they also have a JIS C hardness of up to 75. It is also my opinion that these Shore C measurements confirm Dr. Caulfield's JIS-C measurements.[9]

* Dr. Caulfield was unable to test golf balls bearing the sidestamp Pro V1 392 and Pro V1 392 (stretched), because of their unavailability. However, based on the deposition testimony of Acushnet and the documents produced by Acushnet, it is my understanding that golf balls bearing these sidestamps have a core construction and composition which is the same as the golf balls bearing the sidestamp ◀Pro V1•392▶.[10] Accordingly, golf balls of each of these sidestamps would also have a hardness at the center of the core that is up to 75 degrees JIS C.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a solid core, an intermediate layer, and a cover each of which has a hardness, and where the core center hardness is up to 75 when measured on the JIS-C scale.

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[8] *See* AB 0090094-270 (AB 0090113) and AB 0090271-382 (AB 0090287).

[9] This understanding is confirmed by the deposition of Michael Jordan, who indicated that within Acushnet, it is believed that Shore C and JIS C measurements are comparable. Jordan Depo. at p. 280-281. See also Acushnet 30(b)(6) Depo. (Dalton) of August 22, 2006 at page 162.

[10] *See* AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at pp. 135-136, 142-145 and 167.

F. "the core surface hardness is up to 85 degrees" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a core surface hardness of up to 85 when measured on the JIS-C scale.

I have reviewed a sample of a Pro V1 golf ball bearing the sidestamp ◀Pro V1●392▶, the testing data from Dr. Caulfield, Acushnet produced documents, and Acushnet deposition testimony. Based on that review it is my opinion that the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶ have a hardness at the core surface of up to 85 degrees JIS C. This data is summarized in Table E-3.

Sidestamp	Core Surface Hardness (JIS-C)
Pro V1 392*	82.8*
Pro V1 392 (stretched)*	82.8*
◀Pro V1●392▶	82.8

Table E-3

Additionally, as shown in Acushnet's 2001 and 2002 Competitive Ball Reviews, Acushnet measured the core surface hardness of the Pro V1 392 version at 78 Shore C and the core surface hardness of the ◀Pro V1●392▶ version at 79 Shore C.[11] I understand that there is no exact correlation between Shore C and JIS C measurements. However, based on my experience I understand these measurement methodologies provide similar numerical values for the same specimen. Accordingly, because the surface of the cores of the golf balls measured by Acushnet had a Shore C hardness of 78 and 79, respectively, it is my opinion that they would

[11] *See* AB 0090094-270 (AB 0090113) and AB 0090271-382 (AB 0090287).

also have a JIS C hardness of up to 85. It is also my opinion that these Shore C measurements confirm Dr. Caulfield's JIS-C measurements.[12]

* Dr. Caulfield was unable to test golf balls bearing the sidestamp Pro V1 392 and Pro V1 392 (stretched), because of their unavailability. However, based on the deposition testimony of Acushnet and the documents produced by Acushnet, it is my understanding that golf balls bearing these sidestamps have a core construction and composition which is the same as the golf balls bearing the sidestamp ◀Pro V1•392▶.[13] Accordingly, each of these versions of the above golf balls have a core surface hardness that is up to 85 degrees JIS C.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a core surface hardness of up to 85 degrees JIS-C.

G. "the core surface hardness is higher than the core center hardness by 8 to 20 degrees" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a core surface hardness which is higher than the core center hardness by 8 to 20 degrees when measured on the JIS-C scale.[14]

Based on my review of the testing data from Dr. Caulfield (shown above), Acushnet production documents and Acushnet deposition testimony, it is my opinion that the Pro V1 392,

[12] This understanding is confirmed by the deposition of Michael Jordan, who indicated that within Acushnet, it is believed that Shore C and JIS C measurements are comparable. Jordan Depo. at 280-281. See also Acushnet 30(b)(6) Depo. (Dalton) of August 22, 2006 at page 162.

[13] *See* AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006, 135-136, 142-145 and 167.

[14] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Deposition (Dalton) of July 21 & 25, 2006.

Pro V1 392 (stretched), and ◀Pro V1•392▶ golf balls have a core surface hardness which is higher than the hardness at the center of the core by 8 to 20 degrees JIS C. This data is summarized in Table E-4.

Sidestamp	Core Center Hardness (JIS-C)	Core Surface Hardness (JIS-C)	Difference
Pro V1 392*	63.3*	82.8*	19.5*
Pro V1 392 (stretched)*	63.3*	82.8*	19.5*
◀Pro V1•392▶	63.3	82.8	19.5

Table E-4

This data is confirmed by Acushnet's 2001 and 2002 Competitive Ball Reviews that have been discussed above.

* Dr. Caulfield was unable to test golf balls bearing the sidestamp Pro V1 392 and Pro V1 392 (stretched), because of their unavailability. However, based on the deposition testimony of Acushnet and the documents produced by Acushnet, it is my understanding that golf balls bearing these sidestamps have a core construction and composition which is the same as the golf balls bearing the sidestamp ◀Pro V1•392▶.[15] Accordingly, each of these versions of the above golf balls have a core surface hardness that is higher than the hardness at the center of the core by 8 to 20 degrees JIS C.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a core surface hardness that is higher than the hardness at the center of the core by 8 to 20 degrees JIS-C.

H. "the intermediate layer hardness is higher than the core surface hardness by at least 5 degrees" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of Acushnet and my own knowledge gained

[15] *See* AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at pp. 135-136, 142-145 and 167.

from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have an intermediate layer hardness which is higher than the core surface hardness by at least 5 degrees when measured on the JIS-C scale.[16]

Based on my review of the testing data from Dr. Caulfield, documents produced by Acushnet and deposition testimony of Acushnet, it is my opinion that the Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶ golf balls have an intermediate layer hardness which is higher than the core surface hardness by at least 5 degrees JIS C. This data is summarized in Table E-5.

Sidestamp	Core Surface JIS C Hardness	IML JIS C Hardness*	Difference
Pro V1 392	82.8*	94.4**	11.6
Pro V1 392 (stretched)	82.8*	94.4**	11.6
◀Pro V1●392▶	82.8	94.4**	11.6

Table E-5

* & ** Dr. Caulfield was unable to test the intermediate layers of golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶ because of their limited availability. However, because Pro V1 golf balls bearing the sidestamp ◀●Pro V1 392●▶ have an intermediate layer composition which is identical to that used in golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶, these accused Pro V1 golf balls would have an intermediate layer with the same hardness value as used in the ◀●Pro V1 392●▶ golf balls.[17] Based on the manufacturing guidelines of the respective golf balls, produced by Acushnet, and the deposition testimony of Acushnet, the intermediate layers for all of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), ◀Pro V1●392▶

[16] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

[17] *See* Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006 at pp. 227-230.

and ◀●Pro V1 392●▶ have a composition containing 40 to 50% Surlyn 8940, 50 to 0% Surlyn 7940, 0 to 50% Surlyn 7930, and 10 to 0% Surlyn 8660.[18] Thus, the same composition recipe is used for each of these model golf balls. As such, the intermediate layers in the Pro V1 golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶ have an intermediate layer hardness which is higher than the core surface hardness by at least 5 degrees JIS C.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have an intermediate layer hardness which is higher than the core surface hardness by at least 5 degrees JIS-C.

I. "the cover hardness is lower than the intermediate layer hardness by at least 5 degrees" (Claim 1)

Based on my review at least of the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of the Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have a cover hardness lower than the intermediate layer hardness by at least 5 degrees when measured on the JIS-C scale.[19]

Based on my review of the testing data from Dr. Caulfield (shown above), documents produced by Acushnet and the deposition testimony of Acushnet, it is my opinion that each of the Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶ golf balls have a cover layer

[18] *See* AB 0038214-232, AB 0038279-299, AB 0015542-562 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at 135-136, 142-145 and 167. The different ranges of regrind which is disclosed in the respective manufacturing guidelines will not affect the material hardness in any appreciable amount as the regrind material is made from same material as the intermediate layer itself.

[19] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

hardness which is lower than the intermediate layer hardness by at least 5 degrees JIS C.[20] This data is summarized in Table E-6.

Sidestamp	Cover Shore D Hardness	IML Shore D Hardness*	Difference
Pro V1 392	45	60-66***	15-21
Pro V1 392 (stretched)	45	60-66***	15-21
◀Pro V1•392▶	45	60-66***	15-21

Table E-6

*** Dr. Caulfield was unable to test the intermediate layers of golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶ because of their limited availability. However, because Pro V1 golf balls bearing the sidestamp ◀•Pro V1 392•▶ have an intermediate layer and cover layer composition which are identical to that used in golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶, the intermediate layers and cover layers of these golf balls would have the same hardness values. This is confirmed within Acushnet's documents.[21]

Based on the manufacturing guidelines of the respective golf balls, produced by Acushnet and the deposition testimony of Acushnet, the intermediate layers for all of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), ◀Pro V1•392▶ and ◀•Pro V1 392•▶ have a composition containing 40 to 50% Surlyn 8940, 50 to 0% Surlyn 7940, 0 to 50% Surlyn 7930, and 10 to 0% Surlyn 8660.[22] Accordingly, because these golf balls all have the same

[20] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

[21] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1•392▶ *see* AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006. *See also* AB 0090094-270 (AB 0090113) and AB 0090271-382 (AB 0090287), and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006 at pp. 260-261.

[22] *See* AB 0038214-232, AB 0038279-299, AB 0015542-562 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at pp. 135-136, 142-145 and 167. The different ranges of regrind which is disclosed in the respective manufacturing guidelines will not affect the material hardness in any appreciable amount as the regrind material is made from same material as the intermediate layer itself.

composition recipe, all of these golf balls will have an intermediate layer with the same, or substantially the same, hardness.[23]

Further, based on the manufacturing guidelines of the respective golf balls, produced by Acushnet and the deposition testimony of Acushnet, the cover layers for all of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), ◀Pro V1●392▶ have a composition containing 77.82% of Ethacure 300 (Acushnet Material Code 1513) and 22.18% HCC-19584 Color Dispersion (Acushnet Material Code 1514), and the cover layer for the golf balls bearing the sidestamp ◀●Pro V1 392●▶ have a composition containing 84.2% of a Prepolymer (Ethacure 300 - Acushnet Material Code 1513) and 15.8% of a Curative Blend (HCC-19584 Color Dispersion - Acushnet Material Code 1514), the respective hardnesses of the cover materials for the above golf balls will be substantially the same. This is confirmed by both the deposition testimony of Acushnet and Acushnet's documents which indicate that the target material hardness for the cover material of each of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), ◀Pro V1●392▶ and ◀●Pro V1 392●▶ is 45 Shore D.[24]

I recognize that the data shown in the above table is shown in the Shore D hardness scale, and not the JIS C hardness scale. However, because of the nature of these two hardness scales it can be stated that a hardness difference of 15 to 21 degrees in the Shore D scale will translate to at least 5 degrees difference in hardness in the JIS C scale. I understand that there is no direct correlation between Shore D and JIS C hardness scales. However, a difference of 15 to 21 degrees in the Shore D scale will always provide a difference of at least 5 degrees in the JIS C

[23] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ see AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006, and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006 at pp. 260-261.

[24] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ see AB 0050821, AB 0051522, AB 0050826, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1 golf balls bearing sidestamp ◀●Pro V1 392●▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

scale in the relevant hardness ranges. This understanding is confirmed by data produced by Acushnet that shows that a material measuring 45 with a Shore D test measures 75 on a Shore C test.[25] Based on the similarity of numerical values for Shore C and JIS C tests (discussed above), this confirms that because the cover of the accused balls is at least 15 points different under the Shore D test, the cover is at least 5 points less on the JIS C scale.

Accordingly, all of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), ◀Pro V1●392▶ and ◀●Pro V1 392●▶ have a cover layer hardness which is lower than the intermediate layer hardness by at least 5 degrees JIS C.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have a cover layer hardness which is lower than the intermediate layer hardness by at least 5 degrees JIS C.

J. "the dimples occupy at least 62% of the ball surface" (Claim 1)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, my review of an accused golf ball, my review of certain documents produced by Acushnet, my review of the deposition testimony of the Acushnet and my own knowledge gained from more than 30 years in the golf ball industry, it is my opinion that the accused Pro V1 golf balls have dimples which occupy at least 62% of the surface of the golf ball.[26]

Documents produced by Acushnet show that the dimples occupy at least 78% of the surface of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1●392▶.[27] It is my opinion that the methodology used to determine this percentage is the

[25] *See* Acushnet Depo. (Dalton) of July 20 & 21, 2006 at p. 257-258, Ex. 16.

[26] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ see AB 0050821, AB 0051522, AB 0050826-27, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

[27] For Pro V1 golf balls bearing sidestamps Pro V1 392, Pro V1 392 (stretched) and ◀Pro V1●392▶ see AB 0050821, AB 0051522, AB 0050826-27, AB 0038214-232, AB 0038279-299 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006.

same as that described in the '707 patent, thus showing that each of these golf balls have dimples which occupy at least 62% of the surface of the golf ball.

Specifically, the testimony of Mr. Steven Aoyama confirmed that the methodology used by Acushnet to determine the diameter of the dimples on the surface of the ball, which is used in determining the percentage of dimple coverage, was similar, if not the same, as that set forth in U.S. Patent No. 7,033,287.[28] I have reviewed this methodology and it is my opinion that it is the same methodology as used in defining the dimple edge and diameter as set forth in the '707 patent. Accordingly, all of the golf balls bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶ have dimples that occupy at least 62% of the surface of the golf ball.

Therefore, it is my opinion that the accused Pro V1 golf balls literally have dimples that occupy at least 62% of the surface of the golf ball.

III. Conclusion

Based on the discussions above, it is my opinion that all of the golf balls manufactured by Acushnet bearing the sidestamps Pro V1 392, Pro V1 392 (stretched), and ◀Pro V1•392▶ literally infringe claim 1 of the '707 patent.

[28] *See* Steven Aoyama Depo. at pp. 31-37.

EXHIBIT F

ACUSHNET'S INFRINGEMENT OF U.S. PATENT NO. 5,803,834

I understand that the ◀NXT▶, ◀-NXT-▶, DT So/Lo, ◀DT So/Lo▶, PTS So/Lo, ◀PTS So/Lo▶, Pinnacle Exception and Exception golf balls are accused of infringing claim 1 of U.S. Patent No. 5,803,834. In this Exhibit, I use the term "accused Acushnet golf balls" to refer to the ◀NXT▶, ◀-NXT-▶, DT So/Lo, PTS So/Lo, ◀DT So/Lo▶, ◀PTS So/Lo▶, Pinnacle Exception and Exception golf balls. Based on the information that I have considered and my experience, it is my opinion that each of these golf balls infringes claim 1 of the '834 patent.

I. U.S. Patent No. 5,803,834

A. Summary

United States Patent 5,803,834 ("the '834 patent"), entitled *Two-Piece Solid Golf Ball*, issued on September 8, 1998. Messrs. Hisashi Yamagishi and Jun Shindo are the inventors of the inventions disclosed in the '834 patent.

The '834 patent relates to solid golf balls having increased flight distance, controllability and hitting feel. The golf ball of the invention contains a solid core and a cover and achieves the above characteristics by various relative physical properties between the components of the golf ball.

B. Asserted Claim

I understand that Bridgestone has asserted only claim 1 of the '834 patent. Claim 1 of the '834 patent reads:

> 1. A two-piece solid golf ball comprising a solid core and a cover enclosing the core and having a number of dimples in its surface, wherein said solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that a surface hardness is up to 85 degrees, a center

hardness is lower than the surface hardness by not less than 8 to less than 20 degrees, and a hardness within 5 mm inside the core surface is up to 8 degrees lower than the surface hardness, said cover has a hardness which is higher than the surface hardness of the core by 1 to 15 degrees and a gage of 1.5 to 1.95 mm, and the number of dimples is 360 to 450.

C. Claim Construction Issues

I understand that the claim term "within 5 mm inside the core surface" has been defined by the parties to mean "the hardness of each point within the region of the core which radially extends from the surface to a depth of 5 mm in cross section." I understand that with the exception of this claim term, no other claim terms are in dispute or have been given agreed-upon constructions by the parties.

D. Accused Acushnet Golf Balls

I understand that golf balls manufactured and sold by Acushnet having the sidestamps shown in Table F-1 are alleged to infringe claim 1 of the '834 patent. As used in this Exhibit to my report, the term "accused Acushnet golf balls" means the golf balls made and sold by Acushnet having the sidestamps identified in Table F-1.

Accused Acushnet Golf Balls for Claim 1 of the '834 Patent			
◀NXT▶	◀-NXT-▶	DT So/Lo	◀DT So/Lo▶
PTS So/Lo	◀PTS So/Lo▶	Pinnacle Exception	Exception

Table F-1

It is my understanding that the DT So/Lo and PTS So/Lo golf balls are identical but for their sidestamps.[1] Similarly, I understanding that the ◀DT So/Lo▶ and ◀PTS So/Lo▶ golf balls are identical but for their sidestamps. Any reference herein to the DT So/Lo golf ball

[1] Jordan Depo. at p. 17-18; Welchman Depo. at p. 115; Acushnet 30(b)(6) Depo. (Dalton) of July, 21, 2006 at p. 329; Bartsch Depo. at p. 11.

includes the PTS So/Lo golf ball and any reference to the ◀DT So/Lo▶ golf ball includes the ◀PTS So/Lo▶ golf ball.

II. Infringement Analysis by Claim Term

A. "two-piece solid golf ball"

I understand that the preamble of a claim is typically not considered a limitation. Nonetheless, in view of my review of the testing data provided by Dr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls is a "two-piece solid golf ball."

Acushnet's competitive ball reports and USGA submissions, among many other documents, also support my opinion. I also understand that this Acushnet has never disputed that the accused Acushnet golf balls are "two-piece solid golf ball[s]" as that term is used in claim 1 of the '817 patent.

B. "solid core"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls is a golf ball having a "solid core."

Acushnet's competitive ball reports and USGA submissions, among many other documents, also support my opinion. I also understand that this Acushnet has never disputed that the accused Acushnet golf balls have "solid core[s]" as that term is used in claim 1 of the '817 patent.

C. "cover enclosing the core and having a number of dimples in its surface"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls is a golf ball having a "cover enclosing the core and having a number of dimples in its surface."

Acushnet's competitive ball reports and USGA submissions, among many other documents, also support my opinion. I also understand that this Acushnet has never disputed that the accused Acushnet golf balls have a "cover enclosing the core and having a number of dimples in its surface" as that term is used in claim 1 of the '817 patent.

D. "solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that a surface hardness is up to 85 degrees"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused

Acushnet golf balls having wherein a "solid core has such a distribution of hardness as measured by a JIS-C scale hardness meter that a surface hardness is up to 85 degrees."

Claim 1 of the '834 patent includes elements directed to four hardness measurements of a golf ball's components and the absolute and relative values of those hardness. The first hardness measurement recited in this claim is the surface hardness of the core when measured on a JIS-C scale. As recited in the claim, this hardness can be "up to 85 degrees."

Dr. Caulfield has performed hardness testing of the core surface of the accused Acushnet golf balls. A summary of the results of this testing are included in Table F-2. I have reviewed this data in arriving at my opinions.

Sidestamp	Mean Core Surface Hardness (JIS-C)
◀NXT▶	83.2
◀-NXT-▶	81.8
DT So/Lo PTS SoLo	85.3
◀DT So/Lo▶ ◀PTS So/Lo▶	82.1
Pinnacle Exception	83.5
Exception	79.1

Table F-2.

I have also reviewed certain Acushnet documents that identify the surface hardness of the core of the accused Acushnet golf balls. For example, entries from Acushnet's competitive ball database show that Acushnet measured the ◀DT So/Lo▶ golf ball as having a Shore C hardness[2] of 80 (AB 4645), the DT So/Lo golf ball as having a Shore C hardness of 80-81 (AB

[2] Although not identical, Shore C hardness is roughly comparable to JIS-C hardness. (*See* Acushnet 30(b)(6) Depo. of August 22, 2006 at p. 162 ("We also use JIS-C, which is very similar to Shore C.") and Jordan Depo. at pages 280-281.

4629, AB 4623), and the NXT as having a Shore C hardness of 79 (AB 4660, AB 4663). These documents reveal that Dr. Caulfield's testing data is consistent with testing data arrived in a non-litigation context at Acushnet,[3] confirming my belief that Dr. Caulfield's testing protocols and methods were appropriate.

Based on my review of these materials, it is my opinion that each of the accused Acushnet golf balls has a solid core with a surface hardness "up to 85 degrees" on a JIS-C scale. The core surface hardness for each of these golf balls is less than or equal to 85 degrees. Accordingly, it is my opinion that each of the accused Acushnet golf balls has a surface hardness of the core that is "up to 85 degrees" on a JIS-C scale.

E. "center hardness is lower than the surface hardness by not less than 8 to less than 20 degrees"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls are golf balls wherein a "center hardness is lower than the surface hardness by not less than 8 to less than 20 degrees."

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[3] As shown in the testing data provided by Mr. Caulfield, a batch of golf balls bearing the sidestamps ◄DT So/Lo► and Exception contained cores which were slightly different in hardness and in color than cores found in most other golf balls bearing the same sidestamps. I understand from the testimony of Mr. Ken Welchman, Acushnet's Director of Quality, and Mr. Eric Bartsch, Acushnet's Director of Manufacturing, that Acushnet never uses cores in its DT So/Lo and Pinnacle Exception brand golf balls other than the cores specified for those golf balls. Accordingly, it is my opinion that these balls having slightly different hardnesses and core color are properly included with the testing group.

Dr. Caulfield has also performed hardness testing of the center of the core of the accused Acushnet golf balls. A summary of the results of his data are included in Table F-3. I have reviewed this data in arriving at my opinions.

Sidestamp	Mean Core Surface Hardness (JIS-C)	Mean Core Center Hardness (JIS-C)	Difference
	A	*B*	*A-B*
◀NXT▶	83.2	61.7	21.5
◀-NXT-▶	81.8	60.4	21.4
DT So/Lo PTS SoLo	85.3	63.1	22.2
◀DT So/Lo▶ ◀PTS So/Lo▶	82.1	61.8	20.3
Pinnacle Exception	83.5	61.0	22.5
Exception	79.1	62.0	17.1

Table F-3.

I have also reviewed certain Acushnet documents that identify the hardness at the center of the cores of the accused Acushnet golf balls. For example, entries from Acushnet's competitive ball database show that Acushnet measured the ◀DT So/Lo▶ golf ball as having a Shore C core center hardness of 60 (AB 4645), the DT So/Lo golf ball as having a Shore C hardness of 58/60 (AB 4630, AB 4623), and the NXT as having a Shore C hardness of 56/63 (AB 4661, AB 4664). These documents reveal that Dr. Caulfield's testing data is consistent with testing data arrived in a non-litigation context at Acushnet, confirming my belief that Dr. Caulfield's testing protocols and methods were appropriate.

Based on my review of these materials, it is my opinion that each of the accused Acushnet golf balls has a solid core wherein the "center hardness is lower than the surface hardness by not less than 8 to less than 20 degrees." (See Table F-3).

To the extent the golf balls bearing the sidestamps ◀NXT▶, ◀-NXT-▶, DT So/Lo, PTS So/Lo, ◀DT So/Lo▶, ◀PTS So/Lo▶, and Pinnacle Exception golf balls are not found to literally contain this claim element, an equivalent element is present. It is my opinion that the hardness differentials within 2-3 points of 20 degrees JIS-C is insubstantial and would not affect the performance of a golf ball.

As clearly demonstrated in the Acushnet manufacturing guidelines, such a variation is a function of manufacturability. Thus, Acushnet at least inherently recognizes that the performance characteristics would not be adversely affected in any way so as to show an appreciable difference between a core having a surface to center hardness difference of less than 20 degrees compared to those measured by Dr. Caulfield.

Further, results of hardness testing using durometers can be affected by the durometer used in testing and the person doing the testing. Any variance between Dr. Caulfield's testing results and the claimed range is within the "noise" of hardness testing using durometers. (*See* ASTM D-2240 03 at Section 11 and Tables 3-4).

Therefore, a core having the center-surface hardness differential as shown in Table F-3 would have resilience characteristics substantially the same as those golf balls having center-surface hardness differentials of between less than 20 degrees on a JIS-C scale. This function is provided in the same way, as the cores of the accused NXT, DT SoLo and Pinnacle Exception golf balls are made of a polybutadiene rubber material having the overall physical properties and attributes as described in the '834 patent. The use of the same materials provides the same result in that the desired resilience. This is because a difference core distribution hardness between those measured and as set forth in claim 1 will have not appreciable or substantial affect on the

golf ball performance, as is evidenced in Acushnet's manufacturing specifications for the ◀NXT▶, ◀-NXT-▶, DT So/Lo, PTS So/Lo and Pinnacle Exception golf balls.

F. "a hardness within 5 mm inside the core surface is up to 8 degrees lower than the surface hardness"

In view of my review at least of the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls are golf balls wherein "a hardness within 5 mm inside the core surface is up to 8 degrees lower than the surface hardness."

Dr. Caulfield has performed hardness testing of the accused Acushnet golf balls at the relevant points. A summary of the results of his data are included in Table F-4. I have relied on this data in arriving at my opinions.

Sidestamp	Mean Core Surface Hardness (JIS-C)	Mean Hardness Within 5 mm Inside the Core Surface (JIS-C)	Difference
	A	*B*	*A-B*
◀-NXT-▶	81.8	77.3	5.4
◀DT So/Lo▶ (◀PTS So/Lo▶)	82.1	78.4	5.5
Pinnacle Exception	83.5	79.0	4.9
Exception	79.1	78.9	4.6

Table F-4.

For the ◀NXT▶ and DT So/Lo, I understand that no balls were available to properly test the hardness within 5 mm from the surface of the core. However, Acushnet's manufacturing guidelines clearly show that the cores for the ◀NXT▶ and ◀-NXT-▶ are substantially the

same. For example, the core formulations are identical (compare AB 15341 with AB 15359), the core mixing sequence is identical (compare AB 15342 with AB 15360) and the extrusion and molding conditions are identical (compare AB 15362-63 with AB 15344-45). Further, both cores are red, which would identify them as the same cores.[4] The DT So/Lo and ◀DT So/Lo▶ also have similar cores. I would expect the cores for these two balls to have comparable hardness distributions.

Based on my review of these materials, it is my opinion that each of the accused Acushnet golf balls has a solid core wherein the "a hardness within 5 mm inside the core surface is up to 8 degrees lower than the surface hardness." Indeed, as is shown in Table F-4, the difference between the hardness at the core and the hardness within 5 mm of the surface of the core is less than 8 degrees on a JIS-C scale.

G. "said cover has a hardness which is higher than the surface hardness of the core by 1 to 15 degrees"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the manufacturing guidelines, my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused

[4] Acushnet 30(b)(6) Depo. (Dalton) of June 21, 2006 at p. 145 ("And even the color of the core was the same, indicating that there was no change, and everything else looks to be pretty much the same."); Dalton Depo. at p. 205 ("In the – in the industry the color of the core is usually chosen merely as a convenience for manufacturing to help them keep the different kinds of cores that they make separate from one another."); Acushnet 30(b)(6) Depo. of Acushnet (Dalton) of June 25, 2006 at p. 366 ("The cores would have -- have colors, and different colors, so that we could easily tell them apart in the manufacturing operation. So if you see a tote or a big bin full of those cores you -- you know what they are, just by the color, rather than having to measure them or weigh them or anything else.").

Acushnet golf balls are golf balls wherein "said cover has a hardness which is higher than the surface hardness of the core by 1 to 15 degrees" on a JIS-C scale.

Table F-5, below, shows the difference between the mean cover hardness and the mean core surface hardness based on Dr. Caulfield's testing data. I have relied on this data in arriving at my opinions.

Sidestamp	Mean Core Surface Hardness (JIS-C)	Mean Cover Hardness Prepared Plaque (JIS-C)	Difference
	A	*B*	*B-A*
◀NXT▶	83.2	93.3	10.1
◀-NXT-▶	81.8	94.0	12.2
DT So/Lo (PTS SoLo)	85.3	90.3	5.0
◀DT So/Lo▶ (◀PTS So/Lo▶)	82.1	90.0	7.9
Pinnacle Exception	83.5	90.6	7.1
Exception	79.1	91.4	12.3

Table F-5.

I understand that Acushnet does not routinely measure the hardness of the cover of the accused Acushnet golf balls on a JIS-C scale.

Based on my review of these materials, it is my opinion that each of the accused Acushnet golf balls is a golf ball wherein the "cover has a hardness which is higher than the surface hardness of the core by 1 to 15 degrees" on a JIS-C scale. Indeed, as is shown in Table F-5, the difference in hardness between cover and the core surface is between 5.0 and 12.3 degrees on a JIS-C scale.

H. "cover has…a gage of 1.5 to 1.95 mm"

In view of my review of at least the testing data provided by Mr. Caulfield, my review of documents produced by Acushnet, specifically the competitive ball reports and the

manufacturing guidelines (*see* Table F-6), my review of deposition testimony, and my understanding of the construction of the accused Acushnet golf balls as a person with more than 30 years experience in the field of golf ball design and development, it is my opinion that each of the accused Acushnet golf balls are golf balls wherein the "cover has…a gage of 1.5 to 1.95 mm." Based on the Acushnet targeted finished ball diameter and finished core diameters as specified in Acushnet's manufacturing guidelines (see Table F-6), each of the accused Acushnet golf balls has "cover has…a gage of 1.5 to 1.95 mm." Acushnet's competitive ball reports and USGA submissions, among many other documents, also support my opinion. Further, Acushnet admitted that each of the accused Acushnet golf balls have a cover thickness between 1.5 and 1.95 mm.[5]

[5] *See* Acushnet Response to Bridgestone Request for Admission No. 4.

Sidestamp	Acushnet's Specified Cover Thickness (mm)	Support in Manufacturing Guidelines
◀NXT▶	1.69[6]	AB 15355, AB 86350 (1.6830" φ finished ball) AB 15363, AB 86341 (1.550" φ core)
◀-NXT-▶	1.69	AB 15346 (1.6830" φ finished ball) AB 15373 (1.550" φ core)
DT So/Lo (PTS SoLo)	1.69	AB 15290 (1.6830" φ finished ball) AB 15281 (1.550" φ core)
◀DT So/Lo▶ (◀PTS So/Lo▶)	1.68	AB 15303, AB 86385 (1.6825 " φ finished ball) AB 15296, AB 86378 (1.550" φ core)
Pinnacle Exception	1.69	AB 15305, AB 56202 (1.550" φ core) AB 15320, AB 56217 (1.6830" φ finished ball)
Exception	1.50	AB 15322, AB 86387 (1.565" φ core) AB 15337, AB 86402 (1.6830" φ finished ball)

Table F-6.

I. "the number of dimples is 360 to 450"

I have reviewed the manufacturing guidelines for each of the accused Acushnet golf balls. The manufacturing guidelines confirm that each of the accused Acushnet golf balls have 392 dimples. (Table F-7). Acushnet's competitive ball reports and USGA submissions, among

[6] The thickness values listed in this column were calculated by subtracting the finished core diameter from the finished ball diameter, dividing by two and multiplying by 25.4 mm/in.

many other documents, also support my opinion. Further, Acushnet admitted that each of the accused Acushnet golf balls have between 360 and 450 dimples.[7]

Accordingly, it is my opinion that each of the accused Acushnet golf balls has a between 360 and 450 dimples.

Sidestamp	Number of Dimples	Support in Manufacturing Guidelines
◀NXT▶	392	AB 15339
◀-NXT-▶	392	AB 15357, AB 86334
DT So/Lo PTS SoLo	392	AB 15275
◀DT So/Lo▶ ◀PTS So/Lo▶	392	AB 15292, AB 86374
Pinnacle Exception	392	AB 15305, AB 56202
Exception	392	AB 15322, AB 86387

Table F-7.

III. CONCLUSION

Based on the discussions above, it is my opinion that each of the accused Acushnet golf balls manufactured and sold by Acushnet literally infringe claim 1 of the '834 patent. To the extent any element of claim 1 of the '834 patent is found to not be literally present in any such golf balls, that element would be present under the theory of Doctrine of Equivalents.

[7] *See* Acushnet Response to Bridgestone Request for Admission No. 6.

EXHIBIT G

ACUSHNET'S INFRINGEMENT OF U.S. PATENT NO. 6,679,791

I understand that the Pro V1 and Pro V1x golf balls bearing the sidestamps ◀●Pro V1 392●▶, ◀Pro V1-392▶, ◀●Pro V1x 332●▶, and ◀Pro V1x-332▶ are accused of infringing claims 11, 13, 16 and 26 of U.S. Patent No. 6,679,791. Based on the information I have considered and my experience, it is my opinion that all of these golf balls infringe each of these claims.

I. U.S. Patent No. 6,679,791

A. Summary

United States Patent 6,679,791 ("the '791 patent"), entitled *Golf Ball*, issued on January 20, 2004. Mr. Hideo Watanabe is the listed inventor of the inventions disclosed in the '791 patent.

The '791 patent relates to solid golf balls which provides increased distance on driver shots, improved spin and controllability on approach shots and a good feel on impact. The golf ball of the invention contains a solid core, an intermediate layer, and a cover and achieves the above characteristics by various relative physical properties between the components of the golf ball.

B. Asserted Claims

I understand that Bridgestone is asserting claims 11, 13, 16 and 26 of the '791 patent. These claims read:

> 1. A golf ball comprising a rubbery elastic core having a center and a radially outer surface, a cover having a plurality of dimples on the surface thereof, and at least one intermediate layer situated between the core and the cover; wherein

said intermediate layer is composed of a resin material which is harder than the cover and has a greater hardness than the surface of the elastic core when compared using the same hardness scale, and

said elastic core has a hardness which gradually increases radially outward from the center to the surface thereof, and a difference in JIS-C hardness of at least 22 between the center and the surface.

11. The golf ball of claim 1, wherein said elastic core is formed of rubber as the base material comprising an ingredient selected from a group consisting of pentachlorothiophenol, pentafluorothiophenol, pentabromothiophenol, p-chlorothiophenol and the zinc salt of pentachlorothiophenol.

13. A golf ball comprising a rubbery elastic core having a center and a radially outer surface, a cover having a plurality of dimples on the surface thereof, and at least one intermediate layer situated between the core and the cover; wherein

said intermediate layer is composed of a resin material which is harder than the cover, and has a greater hardness than the surface of the elastic core when compared using the same JIS-C hardness scale, and

said elastic core has a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof, and a difference in JIS-C hardness of at least 22 between the center and the surface.

16. The golf ball of claim 13, wherein the intermediate layer has a Shore D hardness of 50 to 67.

24. A golf ball comprising a rubbery elastic core having a center and a radially outer surface, a cover having a plurality of dimples on the surface thereof, and at least one intermediate layer situated between the core and the cover; wherein

said intermediate layer is composed of a resin material which is harder than the cover having a Shore D hardness of 45 to 58 and has a greater hardness than the surface of the elastic core when compared using the same hardness scale, and

said elastic core has a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof, and a difference in JIS-C hardness of at least 22 between the center and the surface.

26. The golf ball of claim 24, wherein said elastic core is formed of rubber as the base material comprising an ingredient selected from a group consisting of pentachlorothiophenol, pentafluorothiophenol, pentabromothiophenol, p-chlorothiophenol and the zinc salt of pentachlorothiophenol.

C. **Claim Construction Issues**

I understand that there are four claim construction issues with regard to the claims of the '791 patent. I also understand that Bridgestone and Acushnet have agreed to the definition of two of the claim phrases, and disagree as to the remaining claim phrases. I further understand that the remainder of the words of the claims should be read according to their plain and ordinary meaning as would be understood by someone of ordinary skill in the art.

As to the phrase "core…center," I understand that the parties have agreed that this phrase means the "center of the core." For the purposes of this report, I use this definition.

As to the phrase "JIS-C hardness" at core "surface," I understand that Bridgestone and Acushnet have agreed that this phrase has its plain and ordinary meaning. For the purposes of this report, I will use the plain and ordinary meaning of this phrase.

As to the phrase "gradually increases," I understand that Bridgestone and Acushnet disagree as to the definition of this phrase and the Court has not yet reached a decision on the construction of this phrase, as of the date of my report. Bridgestone has proposed that this phrase is to have its "plain and ordinary meaning" and Acushnet has proposed that this phrase means "having a slope which increases and is not steep or abrupt."

Because I disagree with Acushnet's proposed definition, as this definition appears to be overly restrictive to the meaning of "gradually increases" and mathematically incorrect, I will use this phrase's "plain and ordinary meaning" within my report. However, while I disagree with Acushnet's definition, in the following report I will offer my opinion under the

constructions advanced by both Bridgestone and Acushnet. To the extent the Court adopts a construction that differs from one of these two positions, I reserve the right to supplement my report based on the Court's construction.

As to the phrase "a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof," I understand that Bridgestone and Acushnet also disagree as to the definition of this phrase and the Court has not yet reached a decision on the construction of this phrase, as of the date of my report. Bridgestone has proposed that this phrase is to have its "plain and ordinary meaning" and Acushnet has proposed that this phrase mean "a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof, which gradually increases outward" and that "gradually increases" again means "having a slope which increases and is not steep or abrupt."

Because I disagree with Acushnet's proposed definition, as this definition is adding words to the claim which do not appear in the patent claim, I will use this phrase's "plain and ordinary meaning" within my report. However, while I disagree with Acushnet's addition of this new claim language, in the following report I offer my opinion under the constructions advanced by both Bridgestone and Acushnet. To the extent the Court adopts a construction that differs from one of these two positions, I reserve the right to supplement my report based on the Court's construction.

D. Accused Acushnet Golf Balls

I understand that Bridgestone is alleging that certain versions of the Pro V1 and Pro V1x golf balls infringe the asserted claims of the '791 patent. Specifically, I understand that balls shown in Table G-1 are accused of infringing claims 11, 13, 16 and 26 of the '791 patent.

Accused Acushnet Golf Balls for Claims 11, 13, 16 and 26 of the '791 Patent			
◀●Pro V1 392●▶	◀Pro V1-392▶	◀●Pro V1x 332●▶	◀●Pro V1x 332●▶

Table G-1

As used in this Exhibit to my report, reference to the "Pro V1" golf balls refers to those golf balls bearing the sidestamps ◀●Pro V1 392●▶, and ◀Pro V1-392▶, and reference to the "Pro V1x" golf balls refers to golf balls bearing the sidestamps ◀●Pro V1x 332●▶, and ◀Pro V1x-332▶.

II. Acushnet's Infringement of the '791 patent

A. "golf ball comprising a rubbery elastic core having a center and a radially outer surface" (Claims 1, 13 and 24)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have a rubbery elastic core which has a center and a surface radially out from the center.[1]

The accused Pro V1 and Pro V1x golf balls have a round core which has a center and a surface radially out from the center, because of the round shape of the cores.

Further, based on the review of Acushnet's manufacturing guidelines for each of the above-identified golf balls, the cores of the above golf balls are made primarily of a polybutadiene rubber. Because of this, each of these cores are rubbery elastic cores, as a cured polybutadiene, as used in golf ball cores such as the Pro V1 and Pro V1x golf balls, is a rubbery

[1] For Pro V1 golf balls bearing sidestamp ◀●Pro V1 392●▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀●Pro V1x 332●▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

elastic material. This understanding is confirmed by the specification of the '791 patent which specifically states that for the "rubbery elastic core" of the '791 patent "the base rubber is preferably polybutadiene."[2]

I understand that the core of the Pro V1x model golf balls have both an inner and outer core portion. These components combine to form a core, and is therefore a "core" as this term is used in the '791 patent. My understanding of this language is that it is not limited to golf balls having a unitary core and can include a core made of multiple components, such as the core in the Pro V1x golf balls. The deposition testimony of Acushnet, which referred to the combined inner and outer components are a "core," confirms this understanding.[3]

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have a rubbery elastic core that has a center and a surface radially out from the center.

B. <u>"a cover having a plurality of dimples on the surface thereof" (Claims 1, 13, and 24)</u>

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have a cover with a plurality of dimples on the surface thereof.[4]

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[2] '791 Patent, col. 2, lines 27-32.

[3] *See* Acushnet 30(b)(6) Depo. (Dalton) of July 20, 2006 at pp. 53, 79, 146, 258, 282-284 and AB 0086687.

[4] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

Additionally, it is my understanding that Acushnet has admitted that these balls have a cover which covers the inner cover (*i.e.*, intermediate layer) in response to Bridgestone's Requests for Admission No. 35.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have a cover with a plurality of dimples on the surface thereof.

C. "at least one intermediate layer situated between the core and the cover" (Claims 1, 13 and 24)

Based on my review of, at least, the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have at least one intermediate layer situated between the core and the cover.[5]

The accused Pro V1 and Pro V1x golf balls have a single intermediate layer between the core and the cover.[6]

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have at least one intermediate layer situated between the core and the cover.

D. "said intermediate layer is composed of a resin material which is harder than the cover" (Claims 1, 13 and 24)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the

[5] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[6] For further discussion regarding the "intermediate layer" see section discussing infringement of the '852 patent.

golf ball industry, it is my opinion that the intermediate layer of the accused Pro V1 and Pro V1x golf balls are composed of a resin material which is harder than the cover.[7]

Based on my review of Acushnet's manufacturing guidelines for the accused Pro V1 and Pro V1x golf balls (bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶), each of these guidelines indicates that the intermediate layer in each of the respective golf balls is made entirely of an ionomer resin (Surlyn). This is confirmed by the '791 Patent which identifies a Surlyn material as an "ionomer resin."[8] Therefore, in each of the above golf balls the intermediate layer is composed of a resin material.

Additionally, based on my review of Acushnet's manufacturing guidelines and other documents, and the deposition testimony of Acushnet, the intermediate layer in all of the accused Acushnet golf balls (bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶) is made of a material which is harder than that used for the cover. As shown in Acushnet's documents the hardness of the intermediate layers in each of the above golf balls is 64 to 67 Shore D, which has been confirmed by the testing data prepared by Dr. Caulfield, and the hardness of the cover material for the ◀•Pro V1 392•▶ and ◀Pro V1-392▶ golf balls is 45 Shore D, whereas the hardness of the cover material for the ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ golf balls is 48 Shore D.[9] Accordingly, all of the accused Pro V1 and Pro

[7] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[8] '791 Patent, col. 6, Table 2.

[9] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet

V1x golf balls have an intermediate layer which is composed of a resin material and is harder than the cover.

Table G-2 sets forth the target values for the cover material hardness and intermediate layer material hardness for each of the models and versions of the accused Acushnet golf balls, as those values are disclosed in the Acushnet documents.[10]

Ball (Sidestamp)	Target Cover Material Hardness	Target IML Material Hardness
◀●Pro V1 392●▶	45 Shore D	64 to 67 Shore D
◀Pro V1-392▶	45 Shore D	64 to 67 Shore D
◀●Pro V1x 332●▶	48 Shore D	64 to 67 Shore D
◀Pro V1x-332▶	48 Shore D	64 to 67 Shore D

Table G-2

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an intermediate layer composed of a resin material that is harder than the cover.

E. "intermediate layer ... has a greater hardness than the surface of the elastic core when compared using the same hardness scale" (Claims 1 and 24) and "intermediate layer ... has a greater hardness than the surface of the elastic core when compared using the same JIS-C hardness scale" (Claim 13)

Based on my review of at least the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the intermediate layer of the accused Pro V1 and Pro V1x

30(b)(6) Depo. (Dalton) of July 20 & 21, 2006. Additionally, see AB 0087052, AB 0030829, AB 0050831, AB 0038761-762, AB 50826 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at pp. 160-161.

[10] For Pro V1 golf balls bearing sidestamp ◀●Pro V1 392●▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀●Pro V1x 332●▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006. Additionally, see AB 0087052, AB 0030829, AB 0050831, AB 0038761-762, AB 50826 and Acushnet 30(b)(6) Depo. (Dalton) of July 21, 2006 at pp. 160-161, and see also AB 0090383-438 (AB 0090418-19) and AB 0090439-484 (AB 0090461 & 463) and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006 at pp. 259-261.

golf balls has a greater hardness than the surface of the elastic core when compared using the same hardness scale and when using the same JIS-C hardness scale.[11]

Based on my review of Dr. Caulfield's testing data of the versions of the accused Pro V1 and Pro V1x golf balls, the intermediate layer has both a hardness, and JIS-C hardness, greater than the hardness, and JIS-C hardness, of the core surface.

A summary of the data provided by Dr. Caulfield is shown in Table G-3.

Ball (Sidestamp)	Avg. Intermediate Layer Hardness (JIS-C)	Avg. Core Surface Hardness (JIS-C)
◀•Pro V1 392•▶	94.4	87.7
◀Pro V1-392▶	94.3	87.3
◀•Pro V1x 332•▶	94.6	93.5
◀Pro V1x-332▶	94.1	92.4

Table G-3

The data shown in the table above is confirmed by Acushnet's documents that indicate that the surface of the core has Shore D hardness that is less than that of the intermediate layer. Specifically, Acushnet's documents and testimony show that the core has a surface hardness less than that of the intermediate layer.[12] Further, it necessarily follows that if the core surface hardness is less than the intermediate layer hardness in the Shore D scale the same will be true in the JIS C scale.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an intermediate layer which has a greater hardness than the surface of the elastic core when compared using the same hardness scale, and when using a JIS-C scale.

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[11] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[12] Acushnet 30 (b)(6) Depo. (Dalton) of July 20 and 21, Ex. 16, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 and 25, Ex. 36.

F. "elastic core has a hardness which gradually increases radially outward from the center to the surface thereof" (Claim 1)

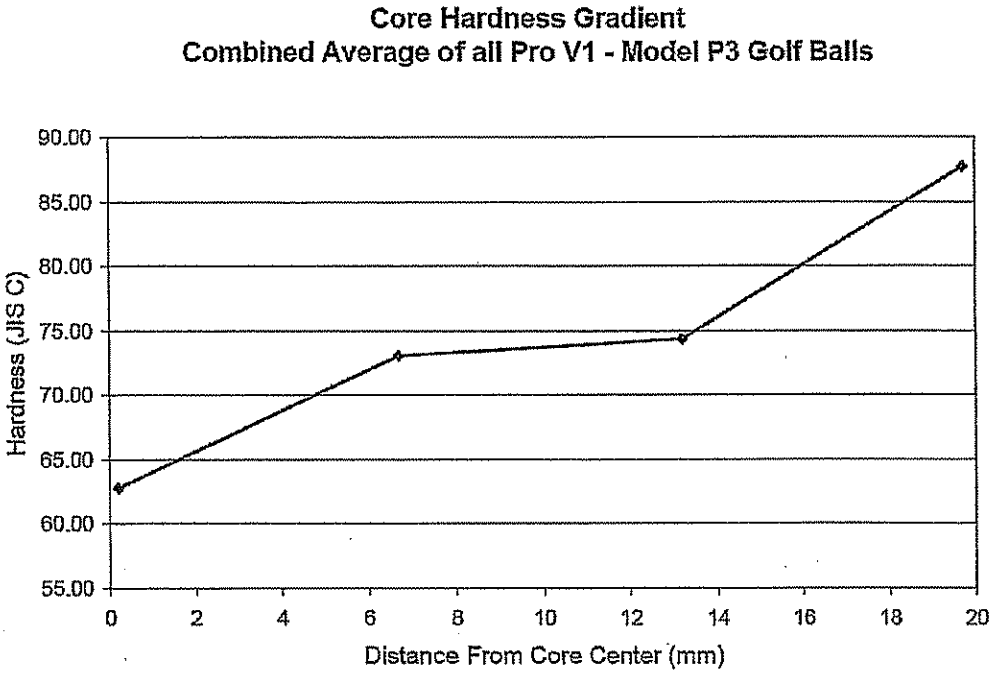
Based on my review of, at least, the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have an elastic core which has a hardness that gradually increases radially outward from the center to the surface thereof.[13] My opinion remains the same under the constructions of the phrase "gradually increases" advanced by both Bridgestone and Acushnet.

With regard to Bridgestone's position that this phrase is to be given its plain and ordinary meaning, I understand the plain and ordinary meaning of this phrase to mean that the hardness of the core gradually increases as the distance from the center of the core increases to the surface. This understanding is based on the use of the language "gradually increases radially outward from the center to the surface thereof".

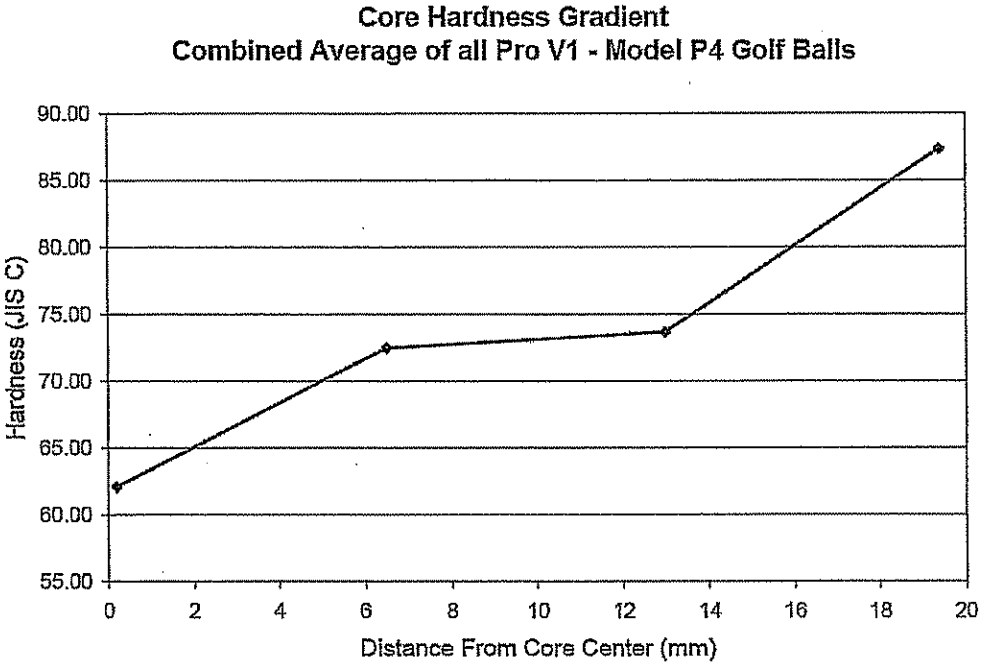
I have reviewed samples of the accused Pro V1 and Pro V1x model golf balls (bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶), the testing data from Dr. Caulfield, and based on that review all of the accused Pro V1 and Pro V1x golf balls have an elastic core which has a hardness that gradually increases radially outward from the center to the surface thereof.

[13] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

Shown below is an average core hardness profile of all of the golf balls tested by Dr. Caulfield bearing the sidestamp ◄•Pro V1 392•►. It is my opinion that this graph represents the core hardness profile of this version of the Pro V1. As shown in this graph, as the distance from the center of the core increases, so does the hardness. Additionally, the increase in hardness is shown to be gradual. I recognize that the graph is not a straight line, however throughout the graph the core hardness gradually increases from the center to the surface of the core.

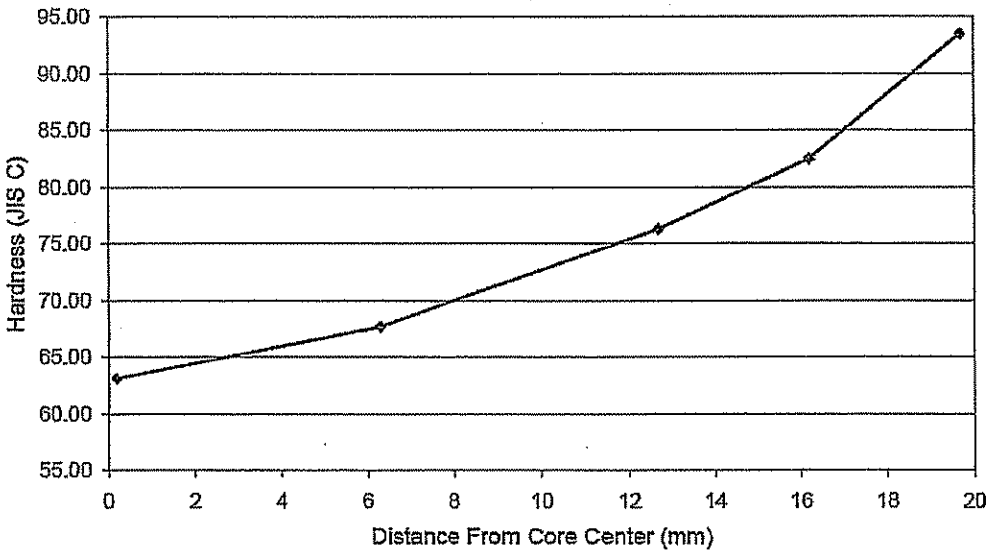


Shown below is an average core hardness profile of all of the golf balls tested by Dr. Caulfield bearing the sidestamp ◀Pro V1-392▶. It is my opinion that this graph represents the core hardness profile of this version of the Pro V1. As shown in this graph, as the distance from the center of the core increases, so does the hardness. Additionally, the increase in hardness is shown to be gradual. I recognize that the graph is not a straight line, however throughout the graph the core hardness gradually increases from the center to the surface of the core.



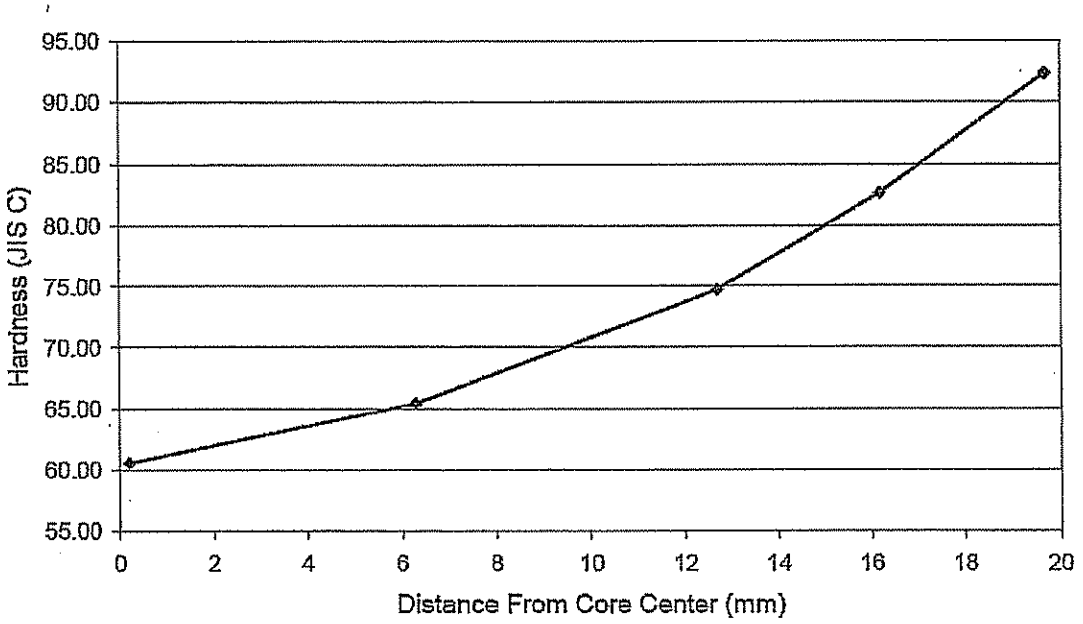
Shown below is an average core hardness profile of all of the golf balls tested by Dr. Caulfield bearing the sidestamp ◀•Pro V1x 332•▶. It is my opinion that this graph represents the core hardness profile of this version of the Pro V1x. As shown in this graph, as the distance from the center of the core increases, so does the hardness. Additionally, the increase in hardness is shown to be gradual. I recognize that the graph is not a straight line, however throughout the graph the core hardness gradually increases from the center to the surface of the core.

Core Hardness Gradient
Combined Average of all Pro V1x - Model PX1 Golf Balls



Shown below is an average core hardness profile of all of the golf balls tested by Dr. Caulfield bearing the sidestamp ◀Pro V1x-392▶. It is my opinion that this graph represents the core hardness profile of this version of the Pro V1. As shown in this graph, as the distance from the center of the core increases, so does the hardness. Additionally, the increase in hardness is shown to be gradual. I recognize that the graph is not a straight line, however throughout the graph the core hardness gradually increases from the center to the surface of the core.

Core Hardness Gradient
Combined Average of all Pro V1x - Model PX2 Golf Balls



It is my opinion that each of the above hardness profiles show that all of the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have an elastic core which has a hardness that gradually increases radially outward from the center to the surface thereof.

My opinion is not changed by the fact that some of the charts shown above are not linear in shape from the center to the surface. It is my understanding that within the golf ball industry the phrase "gradually increases" is not limited to a truly linear shape, but includes all hardness profiles which gradually increase from the center to the surface. This is shown in all of the above graphs where, although the slope changes along the radius of the core, the hardness gradually increases from the center of the core to the surface of the core.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an elastic core that has a hardness that gradually increases radially outward from the center to the surface thereof.

Further, while I disagree with Acushnet's proposed construction of the phrase "gradually increasing" as discussed above, to the extent the Court agrees with Acushnet it is my opinion that the elastic cores of the accused Pro V1 and Pro V1x golf balls still satisfy this claim limitation.

Namely, as shown in each of the graphs above, the core hardness profiles of the accused Acushnet golf balls have an increasing slope that is neither steep nor abrupt. Each version of the Pro V1 golf balls have a hardness profile where the slope of the graphed hardness increases, but the increase is neither steep nor abrupt. Similarly, each version of the Pro V1x golf balls have a hardness profile where the slope of the graphed hardness increases, but the increase is neither steep nor abrupt.

G. "elastic core has a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof" (Claims 13 and 24)

Based on my review of at least of the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the

golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have an elastic core which has a hardness at the center and a hardness at the surface, where the hardness at the surface is greater than the hardness at the center.[14] My opinion remains the same under the constructions of the phrase "a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof" advanced by both Bridgestone and Acushnet.

With regard to Bridgestone's position that this phrase is to be given its plain and ordinary meaning, I understand the plain and ordinary meaning of this phrase to mean that the hardness at the center of the core is less than the hardness of the core, measured at the surface of the core. This understanding is based on the use of the language "a hardness at the center and a hardness at the surface thereof which is greater than the hardness at the center thereof" and my 30 years of experience in the golf ball industry.

I have reviewed samples of the accused Pro V1 and Pro V1x model golf balls (bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶), the testing data from Dr. Caulfield, and based on that review all of the accused Pro V1 and Pro V1x golf balls have an elastic core which has a hardness at its center that is less than hardness measured at the surface of the core.

The data provided by Dr. Caulfield is summarized in Table G-4.

[14] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

Ball (Sidestamp)	Mean Core Surface Hardness (JIS-C)	Mean Core Center Hardness (JIS-C)
◀•Pro V1 392•▶	87.7	62.7
◀Pro V1-392▶	87.3	62.0
◀•Pro V1x 332•▶	93.5	63.1
◀Pro V1x-332▶	92.4	60.5

Table G-4

Table G-4 shows that all of the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have an elastic core which has a hardness at the center of the core which is less than the hardness at the surface of the core.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an elastic core that has a hardness at the center and a hardness at the surface, where the hardness at the surface is higher than the hardness at the center.

Further, while I disagree with Acushnet's inclusion of the phrase "which gradually increases radially outward" into a claim phrase in which it does not appear, as discussed above, to the extent the Court agrees with Acushnet it is my opinion that the elastic cores of the accused Acushnet golf balls still satisfy this claim limitation.

Namely, as shown and discussed above with regard to the claim language "elastic core has a hardness which gradually increases radially outward from the center to the surface thereof," it is my opinion that this claim limitation is also present within the accused Pro V1 and Pro V1x golf balls. Accordingly, even if the Court agrees with Acushnet with regard to the meaning of this claim phrase, it is my opinion that this claim limitation is still satisfied, as it would then read similarly to the claim phrase already discussed.

H. "elastic core has ... a difference in JIS-C hardness of at least 22 between the center and the surface" (Claims 1, 13 and 24)

Based on my review of, at least, of the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition

testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have an elastic core that has a difference, in JIS-C hardness, of at least 22 degrees, between the center and the surface of the core.[15]

My opinion, is based on the agreed upon definitions, namely, that the "core ... center" is the center of the core, and that the phrase "JIS-C hardness" at core "surface" has its plain and ordinary meaning. I understand the plain and ordinary meaning of this phrase to mean the hardness of the surface of the core, when measured using the JIS-C hardness scale. This understanding is based on the use of the language "JIS-C hardness" at core "surface" and my 30 years of experience in the golf ball industry.

I have considered and relied upon the testing data from Dr. Caulfield, and based on that review all of the accused Pro V1 golf balls have an average core hardness differential of 25.0 and 25.3 JIS-C degrees, and the accused Pro V1x golf balls have an average core hardness differential of 30.4 and 31.9 JIS-C degrees.

The data provided by Dr. Caulfield is summarized in Table G-5.

Ball (Sidestamp)	Mean Core Surface Hardness (JIS-C)	Mean Core Center Hardness (JIS-C)	Mean Difference
◀•Pro V1 392•▶	87.7	62.7	25.0
◀Pro V1-392▶	87.3	62.0	25.3
◀•Pro V1x 332•▶	93.5	63.1	30.4
◀Pro V1x-332▶	92.4	60.5	31.9

Table G-5

[15] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

Table G-5 shows that all of the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have an elastic core which has a difference in JIS-C hardness of at least 22 between the center and surface thereof.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an elastic core which has a difference, in JIS-C hardness, of at least 22 degrees, between the center and the surface of the core.

I. **"wherein said elastic core is formed of rubber as the base material comprising an ingredient selected from a group consisting of pentachlorothiophenol, pentafluorothiophenol, pentabromothiophenol, p-chlorothiophenol and the zinc salt of pentachlorothiophenol" (Dependant Claims 11 and 26)**

Based on my review of, at least, of the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have an elastic core which is formed of rubber as the base material, and the core contains a zinc salt of pentachlorothiophenol in the composition of the core.[16]

Based on my review of the Acushnet manufacturing guidelines for the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶, it is my opinion that golf balls made in accordance with these guidelines have a core which is formed of rubber, as a base material.[17] Namely, the above guidelines show that the cores of the

[16] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[17] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25,

golf balls made in accordance with these guidelines use either Bayer (now Lanxess) CB-23, or Shell 1220, or a combination of both as the primary component (i.e., the base material) of the cores. Further, each of these materials are polybutadiene rubbers and, therefore, the base material of the cores in all of the accused Pro V1 and Pro V1x golf balls is a rubber.

Additionally, based on my review of the Acushnet manufacturing guidelines for the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶, it is my opinion that golf balls made in accordance with these guidelines have a core which includes a zinc salt of pentachlorothiophenol (i.e. Zn salt of PCTP), within the composition of the core. As shown in each of the manufacturing guidelines, zinc salt of pentachlorothiophenol is combined with the rubber, and other components, to make up the core of the golf ball.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an elastic core which is formed of rubber as the base material, and the core contains a zinc salt of pentachlorothiophenol in the composition of the core.[18]

J. "wherein the intermediate layer has a Shore D hardness of 50 to 67" (Dependant Claim 16)

Based on my review of, at least, of the testing data contained in Dr. Caulfield's Expert Report, the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the

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2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[18] Reference is further made to my report concerning the '652 patent as it relates to the use of zinc salt of pentachlorothiophenol.

golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have an intermediate layer which has a Shore D hardness of 50 to 67.[19]

Based on my review of the documents produced by Acushnet and the deposition testimony of Acushnet, it is my opinion that all of the accused Pro V1 and Pro V1x golf balls, (bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶) have an intermediate layer with a Shore D hardness in the range of 50 to 67.[20]

I have also considered and relied upon the testing data from Dr. Caulfield, and based on that review all of the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have an intermediate layer which has a Shore D hardness of 50 to 67.

A summary of the data provided by Dr. Caulfield is shown in Table G-6.

Ball (Sidestamp)	Average Test Hardness (Shore D)	Acushnet Hardness (Shore D)
◀•Pro V1 392•▶	69.6	64-67
◀Pro V1-392▶	70.4	64-67
◀•Pro V1x 332•▶	70.3	64-67
◀Pro V1x-332▶	69.3	64-67

Table G-6

I recognize that the measured hardnesses by Dr. Caulfield are slightly higher than the range of 50 to 67, as indicated within the claim. However, I have reviewed the deposition testimony of Acushnet and documents produced by Acushnet that indicate that Acushnet believes the hardness of this layer to be between 64 and 67 degrees Shore D.

[19] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

[20] *See* Acushnet 30(b)(6) Depo. (Dalton) of July 20, 2006 at pp. 259-261.

Namely, as shown in Acushnet's Competitive Ball Reports, Acushnet has measured the hardness of the intermediate layers of ◀•Pro V1 392•▶ golf balls at 65/64 Shore D (AB 0090418/AB 0090461), and ◀•Pro V1x 332•▶ golf balls at 67/65 Shore D (AB 0090419/AB 0090463). Further, because the golf balls bearing the sidestamps ◀Pro V1 392▶ and ◀Pro V1x-332▶ have the same intermediate layer composition as the above balls, it is my opinion that they would have the same material hardness. Thus, within Acushnet, based on Acushnet's own testing data, it is believed that the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have an intermediate layer hardness in the range of 64 to 67 Shore D.

This has also been confirmed by the deposition testimony of Acushnet which indicates that although the intermediate layer material used in the ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ golf balls has a hardness of 68 Shore D when measured while on the core, the hardness is in the range of 65 or 66 Shore D when taken on a test piece.[21]

Because of the nature of the Shore D hardness test it is my opinion that the data generated by Dr. Caulfield is consistent with that generated by Acushnet through its own testing. This is because the Shore D testing standard ASTM D2240 indicates that the repeatability precision of a Shore D test, between laboratories is 3.54 in materials having an average hardness level of both 54.5 and 82.3 Shore D hardness. This correlates to a tolerance of ±3.54 Shore D degrees between laboratories and is consistent with the data from both Acushnet and Dr. Caulfield.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have an intermediate layer with a Shore D hardness of 50 to 67.

[21] *See* Acushnet 30(b)(6) Depo. (Dalton) of July 20, 2006 at pp. 259-261.

It is also my opinion that to the extent the above Pro V1 and Pro V1x golf balls are not found to literally infringe this limitation, they are equivalent, and infringe under the doctrine of equivalents.

It is my opinion that the minimal difference in Shore D hardness within the range measured by Dr. Caulfield, as compared to a Shore D hardness of 67, would not adversely affect the performance of the intermediate layer within the golf ball, and is within the range of precision of the measurement and repeatability of the manufacture of such a layer.

Within the golf ball industry it is understood that there are manufacturing tolerances for all characteristics of the various components of golf balls in which the performance of the ball is not adversely affected. This has been evidenced in the discussion regarding various claim limitations of the '852 Patent (discussed previously in this report). These tolerances are necessary due to the nature of golf ball manufacturing and that the processes involved inherently have some variability causing no two balls in even the same batch to be exactly the same. This is particularly true in the manufacture of intermediate layers of golf balls, where the composition of the intermediate layer can change based on manufacturability and processibility needs. This is evidenced by the intermediate layer recipe formulation set forth in each of the manufacturing guidelines for the accused balls.

For the accused Pro V1 golf balls the recipe for the intermediate layer is 40-50% of Surlyn 8940, 50-0% of Surlyn 7940, 0-50% of Surlyn 7930 and 10-0% of Surlyn 8660.[22] For the accused Pro V1x golf balls the recipe for the intermediate layer is 50% of Surlyn 7940, 50-40% of Surlyn 8940, and 0-10% of Surlyn 8660.[23]

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[22] *See* AB 0015542-62 for ◀•Pro V1 392•▶ golf balls and AB 0038532-60 and AB 0086277-304 for ◀Pro V1-392▶ golf balls, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 and 25, 2006.

[23] *See* AB 0015563-87 for ◀•Pro V1x 332•▶ golf balls and AB 0015471-97 and AB 0086305-331 for ◀Pro V1x-332▶ golf balls, and Acushnet 30(b)(6) Depo. (Dalton) of July 20 and 21, 2006.

These large ranges for material percentage are for manufacturing processibility, and specifically to manage the melt flow index of the material during manufacture. Accordingly, it is my opinion that because such a wide range of percentages of different materials can be used, a variation in the hardness of the intermediate layer will occur during manufacture. It is my opinion that these changes do not affect the performance of the golf ball or intermediate layer, as evidenced by the large permitted ranges in the compositions of the intermediate layers as set forth in the manufacturing guidelines.

Accordingly, in view of the disclosure of the '791 patent and the technology considerations at the time, golf balls having an intermediate layer with a hardness as measured by Dr. Caulfield would be equivalent to the intermediate layer of the '791 patent.

Namely, in the final product having a construction of that of set forth in the '791 patent, the spin rate, feel, control, distance and resilience would not be adversely affected in any way so as to show a substantial difference between an intermediate layer having a Shore D hardness of 67 and as measured by Dr. Caulfield (*i.e.*, 69-70).

Therefore, an intermediate layer of the measured hardness functions the same as an intermediate layer having a Shore D hardness of 67, in that both would provide the resilience normally lost in a full shot by a driver when employing a soft cover material. This function is provided in the same way, the intermediate layer is made of a material which creates the desired resilience to optimize distance performance. In fact, each of the accused Pro V1 and Pro V1x golf balls employ the same material identified in the '791 patent as the "preferred" material to be used for the intermediate layer. Namely, the '791 patent states that "the use of ionomer resin by

itself is especially preferred."[24] This is what is used in the accused Pro V1 and Pro V1x golf balls, *i.e.*, a 100% ionomer resin composition.

Because of this, the overall result in ball performance is the same and performance of the intermediate layer is the same, in that the resilience of the ball from the club face would be effectively the same between an intermediate layer of the measured hardnesses and a Shore D hardness of 67.

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls have balls literally have an intermediate layer with a Shore D hardness of 50 to 67, as that phrase would be understood by those in the golf ball industry, having its plain and ordinary meaning, and to the extent it is found that that any of these golf balls do not literally have this feature, they are equivalent.

K. "the cover having a Shore D hardness of 45 to 58" (Claim 24)

Based on, at least, my review of some of the accused Acushnet golf balls, documents produced by Acushnet, the deposition testimony of Acushnet and from my own knowledge and experience gained from 30 years in the golf ball industry, it is my opinion that the accused Pro V1 and Pro V1x golf balls have cover which has a Shore D hardness of 45 to 58.[25]

Based on my review of Acushnet's documents and the testimony of Acushnet, it is my understanding that the cover of the golf balls bearing the sidestamps ◀•Pro V1 392•▶ and

[24] '791 Patent, col. 4, lines 19-28.

[25] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

◀Pro V1-392▶ have a Shore D hardness of 45, and the cover of the golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ have a Shore D hardness of 48.[26]

Therefore, it is my opinion that the accused Pro V1 and Pro V1x golf balls literally have a cover with a Shore D hardness of 45 to 58.

III. CONCLUSION

Based on the discussions above, it is my opinion that all of the golf balls bearing the sidestamps ◀•Pro V1 392•▶, ◀Pro V1-392▶, ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ literally infringe claims 11, 13, 16 and 26 of the '791 patent. Additionally, to the extent that any version or models of these golf balls are not found to literally infringe, they are equivalent and infringe under the doctrine of equivalents.

[26] For Pro V1 golf balls bearing sidestamp ◀•Pro V1 392•▶ see AB 0050821, AB 0051522, AB 0038761-62, AB 0015542-562, and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for golf balls bearing the sidestamp ◀Pro V1-392▶ see AB 0038532-560, AB 0086277-304 and Acushnet 30(b)(6) Depo. (Dalton) of July 21 & 25, 2006; for Pro V1x golf balls bearing the sidestamps ◀•Pro V1x 332•▶ and ◀Pro V1x-332▶ see AB 0086687, AB 0051523, AB 0050829, AB 0050831, AB 0015563-587, AB 0015471-497, AB 0086305-331 and Acushnet 30(b)(6) Depo. (Dalton) of July 20 & 21, 2006.

EXHIBIT 10

IN THE UNITED STATES DISTRICT COURT

DISTRICT OF DELAWARE

BRIDGESTONE SPORTS CO.,LTD., and BRIDGESTONE GOLF, INC., Plaintiffs, -vs- ACUSHNET COMPANY, Defendant. C.A. No. 05-132 (JJF) Highly Confidential

ACUSHNET COMPANY, Counterclaim Plaintiff, -vs- BRIDGESTONE SPORTS CO.,LTD., and BRIDGESTONE GOLD, INC., Counterclaim Defendant.

Deposition of Kevin L Jones
Chicago, Illinois
Friday, March 30, 2007

DIGITAL EVIDENCE GROUP

1111 16th Street, NW Suite 410

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(202) 232-0646

A. Yes, that's -- you know, we might be able to find something if we looked.

Q. Okay. About the P2 balls, did you play any role in obtaining the P2 balls?

A. From my recollection the P2 balls, we -- we received the P2 balls from Paul Hastings.

I believe they even came in like an egg carton or something. They came from like used golf balls, usedgolfballs.com or something. In the photographs they obviously clearly show, but that's my recollection of the P2 balls.

Q. Okay. Okay.

If it's okay with you, I'm done, and I would be ready to go to all this mess data, you know, all the other exhibits, so I would like to break for lunch, so I could have time to organize for that?

MR. WIKBERG: Okay. 45 minutes or so.

BY MS. STASIO:

Q. Is that okay with you?

A. Yes.

THE VIDEOGRAPHER: Going off the record at 11:55 a.m.

(Whereupon a recess was had.)

EXHIBIT 11

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

BRIDGESTONE SPORTS CO. LTD., AND BRIDGESTONE GOLF, INC Plaintiff, v. ACUSHNET COMPANY Defendant.	Case No. 05-132(JJF)
ACUSHNET COMPANY Counterclaim-Plaintiff, v. BRIDGESTONE SPORTS CO. LTD.,, AND BRIDGESTONE GOLF, INC Counterclaim-Defendant.	

EXPERT REPORT OF EDWARD M. CAULFIELD, Ph.D., P.E.

REPORT OF EDWARD M. CAULFIELD

5. I am a Professional Engineer registered in the State of Illinois and in the State of Florida, and I am also affiliated with the following professional organizations:

American Society of Mechanical Engineers
American Society of Testing and Materials
Society for Experimental Mechanics
American Association for Automotive Medicine
Society of Automotive Engineers
Illinois Society of Professional Engineers
National Society of Professional Engineers

6. Before joining Packer Engineering in 1979, I was an Assistant Professor in the Department of Mechanical Engineering at the University of Illinois and taught courses in dynamics, vibration, materials science and the design of machinery.

7. In my educational background and duties at Packer Engineering, I have developed a thorough understanding of the properties and behavior of materials and mechanical design issues. My personal practice involves the application of materials engineering and mechanical engineering principles to design review and evaluation, failure analysis, patent infringement analysis, accident investigation and reconstruction, and testing. Since joining Packer Engineering in 1979, I have consulted for a wide range of industrial clients, including golf equipment manufacturers, farm machinery and industrial equipment manufacturers and automobile makers.

8. Based on my education, training, knowledge of the literature, and professional experience, I am fully competent to testify regarding the subject matters of, among other things, the material properties and material property testing of golf balls including those material properties described and claimed in the patents at issue in this matter.

9. Additional details regarding my qualifications and background can be found in my attached CV and Rule 26 list of cases in which I have testified (Exhibit EX-1)

III. MATERIALS CONSIDERED

10. In addition to information as a result of my general background and experience, I have reviewed and asked my engineering staff to help in the review of materials relating to the patents-in-suit as listed in Exhibit EX-2. Exhibit EX-3 contains the testing standards utilized in the test protocols for this investigation.

IV. METHODOLOGY

11. This investigation included the evaluation of a number of golf balls manufactured by Acushnet Company for their material properties and performance as related to the patents at issue in this matter. The Acushnet golf balls evaluated in this study included Titleist Pro V1, Titleist Pro V1x, Titleist Pro V1 Star, Titleist DT So/Lo balls, Titleist NXT, Titleist NXT Tour and Pinnacle Exception golf balls. All balls included in this investigation were obtained from standard retail outlets.

12. A number of evaluations related to the patents at issue were conducted on these golf balls. Determination of which material properties to be evaluated in this investigation was performed by Mr. Larry Cadorniga. In consulting with Mr. Cadorniga, I determined the manner in which these properties were to be tested. These material properties included hardness and specific gravity of the core, intermediate layer and cover, 100 kg distortion of the ball and core, thickness and diameter of various golf ball components and a rebound/drop test. Test protocols were developed for each specific test requested

The average of these six values was then calculated for each individual ball. Seventy-two (72) balls were tested from golf ball models NT3, N2 and D2. Forty-seven (47), fifty-two (52), twenty-three (23), twenty-one (21), and twenty (20) balls were tested from golf ball models E2, E1, NT2, N1 and D1, respectively.

22. Exhibit EX-28 contains eight bar charts representing the number of balls as a function of average cover thickness for each individual ball tested for golf ball models NT3, NT2, N2, N1, D2, D1, E2 and E1, respectively.

F. Core Hardness

23. The core hardness results for Pro V1 (model P2), Pro V1 Star (model PS), NXT models (models N2 and N1), DT So/Lo (models D2 and D1) and Pinnacle Exception (models E2 and E1) golf balls are shown in Exhibit EX-18, Table VI, Core Hardness (JIS C) for Pro V1, Pro V1 Star, NXT, DT So/Lo and Pinnacle Exception. All core hardness testing was performed in accordance with the core hardness test protocol contained in Exhibit EX-9. For golf ball model PS, twenty-four (24) golf balls were tested and core hardness testing was only performed on the surface of the core.

24. Golf balls Pro V1 (model P2), NXT (models N2 and N1), DT So/Lo (models D2 and D1) and Pinnacle Exception (models E2 and E1) were all tested at the core surface and as well as at the core center. Sixty (60) balls were tested for golf ball models N2 and D2. Thirty-six (36), fifty-two (52), twenty-one (21), twenty (20) and five (5) balls were tested from golf models E2, E1, N1, D1 and P2, respectively.

25. In Table VI, the average value reported for the core surface represents the combined average of all balls tested for each ball model tested. In accordance with the test protocol (Exhibit EX-9), hardness measurements were performed at five different locations around the core's circumference. An average core surface hardness value was then calculated for each individual ball. The combined average, standard deviation, minimum and maximum values reported for each golf ball model in Table VI were then determined from the individual ball average hardness values.

26. Two significantly different core colors were observed between balls from golf ball models E2 and D2. Group FF from golf ball model D2 had a dark blue core whereas the other D2 model balls had aqua blue cores. These darker blue cores (Model D2, Group FF) had a lower surface hardness compared to the other model D2 balls tested. The average surface hardness from nine (9) model D2, group FF balls, was 75.2 JIS C compared to the overall D2 model average of 82.1 JIS C.

27. Cores from group GG, golf ball model E2, also contained cores whose color differed from the other cores from model E2. These cores (model E2, group GG) were very light blue colored whereas the other cores from group E2 had a darker blue core. The surface hardness on golf ball model E2, group GG were lower compared to the other balls tested from model E2. The average surface hardness from nine (9) model E2, group GG balls, was 73.9 JIS C compared to the overall E2 model average of 79.1 JIS C.

28. In Table VI, the average value reported for the core center hardness represents the combined average of all individual balls tested for each ball model tested. In accordance

with the test protocol (Exhibit EX-9), five hardness measurements were performed at core's center. An average core center value was then calculated for each individual ball. The combined average, standard deviation, minimum and maximum values reported for each golf ball model in Table VI were then determined from these individual ball average hardness values.

29. In addition to the core surface and core center hardness testing, twenty-four balls (24) from golf balls NXT (model N2) and Pinnacle Exception (models E2 and E1) and twenty-two (22) from DT So/Lo (model D2) were also tested for hardness using specimens prepared from the core's outermost 5 mm. This testing was performed in accordance with the "Hardness at 5 mm Within the Surface of the Core" section of the Core Hardness and Diameter Measurement Protocol contained Exhibit EX-9. In accordance with the protocol, these test samples extended radially from the core's surface to a depth of 5 mm below the core surface. On each ball, five hardness measurements were performed at the center of the plane representing a depth of 5 mm radially below the core surface. This hardness measurement represents the core hardness within 5 mm of the core surface.

30. In Table VI, the average value reported for the core hardness within 5 mm of the core surface represents the combined average of all balls tested for each golf ball model tested. The combined average, standard deviation, minimum and maximum values reported for each golf ball model in Table VI were determined from the individual ball average hardness values.

31. The difference between the hardness at the core surface and hardness within 5 mm of the core surface was computed using the average hardness values at these two locations for each individual ball. Exhibit EX-29 contains four bar charts showing the number of balls as a function of the hardness difference between the core surface and material within 5 mm of the core surface for each individual ball tested for golf ball models N2, D2, E2 and E1. Table VI contains the combined average of this hardness difference for each golf ball model tested.

G. Core Hardness Gradient – Pro V1x (PX2 and PX1)

32. The core hardness gradient test results for Pro V1x (models PX2 and PX1) golf balls are shown in Exhibit EX-19, Table VII, Pro V1x Core Hardness Gradient (JIS C). Sixty (60) and forty-three (43) golf balls were tested from models PX2 and PX1, respectively. The surface and core center hardness testing was performed as described in paragraphs 25 and 28 above.

33. In addition to the surface and core center, hardness testing was also performed at a distance of 3.5 mm, 7 mm and 13.4 mm below the core's surface. In accordance with the test protocol (Exhibit EX-9), on each individual ball, five hardness measurements were performed at each of these locations. An average value was then calculated for each of the three locations for every individual ball. The combined average, standard deviation, minimum and maximum values reported for each golf ball model in Table VII were then determined from these individual ball average hardness values.

34. Exhibit EX-30 contains sixty-one charts, sixty of which depict the core hardness gradient for each individual model PX2 ball tested. The final chart depicts the combined average core hardness gradient for golf ball model PX2. There are five points plotted on each of the charts representing the five hardness test locations described above.

35. Exhibit EX-31 contains forty-four charts, forty-three of which depict the core hardness gradient for each individual model PX1 ball tested. The final chart depicts the combined average core hardness gradient for golf ball model PX1. There are 5 points plotted on each of the charts representing the five hardness test locations described above.

H. Core Hardness Gradient – Pro V1 (P4 and P3)

36. The core hardness gradient test results for Pro V1 (models P4 and P3) golf balls are shown in Exhibit EX-20, Table VIII, Pro V1 Core Hardness Gradient (JIS C). Sixty (60) and thirty-five (35) golf balls were tested from models P4 and P3, respectively. The surface and core center hardness testing was performed as described in paragraph 25 and 28 above.

37. In addition to the surface and core center, hardness testing was all performed at a distance of 6.5 mm and 13 mm below the core's surface for model P4. Due to the P3 model's larger nominal core diameter, these dimensions were increased slightly to 6.6 mm and 13.1 mm for the P3 model. In accordance with the test protocol (Exhibit EX-9), on each individual ball, five hardness measurements were performed at each of these locations. An average value was then calculated for each of these locations for every individual ball. The combined average, standard deviation, minimum and maximum values reported

for each golf ball model in Table VIII were then determined from these individual ball average hardness values.

38. Exhibit EX-32 contains sixty-one charts, sixty of which depict the core hardness gradient for each individual P4 ball tested. The final chart depicts the combined average core hardness gradient for golf ball P4. There are four (4) points plotted on each of the charts representing the four hardness test locations described in paragraphs 36 and 37 above.

39. Exhibit EX-33 contains thirty-six charts, thirty-five of which depict the core hardness gradient for each individual P3 ball tested. The final chart depicts the combined average core hardness gradient for golf ball model P3. There are of four (4) points plotted on each of the charts representing the four (4) hardness test locations described in paragraphs 33 and 34 above.

I. IML Hardness – Packer Engineering Prepared Plaques

40. The intermediate layer (IML) hardness test results, performed on Packer Engineering prepared plaques in accordance with Exhibit 11, for Pro V1x (models PX2 and PX1), Pro V1 (models P4 and P3), and Pro V1 Star (model PS) golf balls are shown in Exhibit Ex-21, Table IX, Intermediate Layer Hardness Results for Pro V1x, Pro V1 and Pro V1 Star (Packer Engineering Prepared Plaques). Seven (7), four (4), eight (8), three (3), and four (4) hardness plaques were prepared and tested in accordance with the Test Protocol for Intermediate Layer Hardness contained in Exhibit EX-10 from golf ball models PX2, PX1, P4, P3 and PS, respectively. IML test plaque PX1.TT was not utilized due to an

EX-9

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Protocol for Core Hardness and Diameter Measurements

This protocol describes the steps to be taken for accurately measuring the hardness at different locations on and inside of the golf ball core. The core hardness test method is in accordance with JIS K6301 – Physical Testing Methods for Testing Vulcanized Rubbers and JIS K6253 – Hardness Testing Methods for Rubber, Vulcanized or Thermoplastic, copies of which are attached as Exhibits C and D, unless otherwise specified.

CORE DIAMETER

BALLS: Pro V1, Pro V1x, Pro V1*, NXT, NXT Tour, DT So/Lo, and Exception

1. Randomly select golf balls of a single type and record all required information as set forth in the GENERAL INSTRUCTIONS.

2. Remove the outer cover and intermediate layers (if present) of the golf ball by using a side cutter. The cutting tool should be advanced into the ball at small increments to ensure that the core is not scarred or scarring is at a minimum.

    a. Prior to cutting remove the cover, refer to photographs of the subject golf ball specimen sectioned in half, or a data chart, to determine the core color, and ball structure. This will notify operator of a possible intermediate layer, and aid in identifying when the operator is close to the core surface.

    b. NOTE: All Pro V1, Pro V1x and Pro V1* golf balls will have a clear intermediate layer before the core. All NXT, NXT Tour, DT So/Lo and Pinnacle Exception golf balls will only have a cover before the core.

3. Manually peel the cover and intermediate layer, if present, of the golf ball to expose the solid core.

    ONCE THE CORE IS EXPOSED ALL OF THE FOLLOWING HARDNESS TESTING FOR THE CORE SURFACE MUST BE COMPLETED WITHIN 24 HOURS.

4. Mark or placard each of the separated components (core, cover and intermediate layer) with the serial number of the golf ball. Place each of the marked or placarded cover and intermediate layer sections in individual packaging marked with the ball serial number.

5. Closely examine the core surface adjacent to the cutting tool path to determine if the core surface was scarred or otherwise nicked by the cutting tool.

a. No testing of the core surface hardness can take place within 20 degrees of the surface scarring.

6. Using a digital height gauge measure and record the outermost diameter of the core at five (5) randomly selected core orientations, not within 30 degrees of each other. Further, the core diameter measurement cannot take place where the core has been nicked or scarred.

    a. Prior to making any measurements, the accuracy of the height gauge must be verified using a certified gauge block.

7. Using the determined average core diameter of each core calculate the standard deviation of the averages.

CORE SURFACE HARDNESS

This test is required to be performed on all NXT, NXT Tour, DT So/Lo, Pinnacle Exception and Pro V1 golf balls. The core hardness test method is in accordance with JIS K6301 – Physical Testing Methods for Testing Vulcanized Rubbers and JIS K6253 – Hardness Testing Methods for Rubber, Vulcanized or Thermoplastic, unless otherwise specified.

BALLS: Pro V1, Pro V1x, Pro V1*, NXT, DT So/Lo, and Exception

8. Verify hardness tester accuracy by performing hardness testing on calibration block.

    a. Hardness results performed on the calibration block must be within the limits specified on the calibration block.

    b. If the machine is not in calibration do not continue.

9. Perform hardness measurements in the JIS C hardness scale at five (5) locations on the surface of the ball. Each of the five points are to be randomly selected and are to be marked to identify the location of the hardness test. The hardness measurement points must not be within 20 degrees of each other, and are not to have any scarring or nicks. Further, at each of the five locations five (5) individual and discrete measurements are to be taken.

    a. The JIS C testing should be in accordance with the JIS K6301 standards. It is recognized that the core is a round surface, however, this deviation from the hardness standard is acceptable.

    b. Confirm the highest point of the core is the point that is being tested. The presser foot of the indenter must not contact the core's surface until the indenter is completely immerged into the material.

c. The locations of the hardness measurement points are to be selected taking into account the protocol set forth below regarding testing at 5 mm within the surface of the core, so as to minimize the number of measurement points which are permanently lost when that protocol is performed.

10. Record each individual measurement in a data table and calculate an average for each of the five locations tested. Using these five averages calculate a core surface hardness average. Record the averages in the data table.

11. Using the determined average hardness at the surface of each core calculate the standard deviation of the averages.

HARDNESS AT 5MM WITHIN THE SURFACE OF THE CORE

This test is only required to be performed on NXT, DT So/Lo and Pinnacle Exception golf balls, and is not to be performed on any Pro V1 golf balls. The core hardness test method is in accordance with JIS K6301 – Physical Testing Methods for Testing Vulcanized Rubbers and JIS K6253 – Hardness Testing Methods for Rubber, Vulcanized or Thermoplastic, unless otherwise specified.

BALLS: NXT, DT So/Lo, and Exception

12. Remove cover in accordance with Steps 2 and 3 above.

13. Select a portion of the core to be tested, preferably not resulting in the removal or discarding any core surface hardness testing locations.

14. Machine gripping surfaces or slots in the core opposite from the selected portion of the core to be tested, as described in other testing protocols so as to allow for the secure gripping of the core.

15. Use a band saw to cut off the selected portion of the core (selected in Step 12) at a point at least 8 mm from the surface of the core, so as to create a specimen which is at least 8 mm in thickness at its deepest point.

    a. Store the remaining core section in a sealed, evacuated container/package so as to limit exposure to the atmosphere, and place with the remaining ball components from the golf ball tested.

16. Secure the specimen created in Step 14 in a Bridgeport, or comparable, end-mill device in such a way to ensure the specimen is secure while minimizing squeezing and distorting the specimen. The specimen is to be secured such that the surface cut by the band saw is facing the end-mill tooling (i.e. curved surface away), and the surface is level.

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ONCE THE FOLLOWING MACHINING PROCESS BEGINS ALL OF THE FOLLOWING HARDNESS PROTOCOL FOR 5 MM WITHIN THE CORE SURFACE MUST BE COMPLETED WITHIN 24 HOURS.

17. Using the Bridgeport, or comparable, end-mill machine, machine off the cut surface of the specimen in multiple passes. The depth of each pass is to minimal such that the specimen is not destroyed during the process or dislodged from the end-mill gripping vise.

    a. A cutting head and cutting speed must be used to minimize burrs and heat generation during the machining process.

    b. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

18. The amount of material to be removed is to result with a test specimen which is 5 mm thick at its thickest point.

    a. As the 5 mm limit is approached the depth of each pass is to be reduced to a depth of no more than 0.05 mm. This will ensure minimal damage and scarring to the surface of the specimen.

    b. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

    c. The tolerance of the thickness of the specimen, at its thickest point is 5 mm +/- 0.2 mm. If the amount of removed material is within this tolerance, the test may proceed.

19. Inspect the machined surface of the test specimen. If the surface is smooth testing may proceed. If the test surface is not smooth it is to be hand buffed to provide a smooth surface.

20. Record the height of the test specimen.

    a. The tolerance of the 5 mm thickness is +/- 0.2 mm. If the amount of removed material is within this tolerance, the test may proceed.

    b. If the test specimen is not within this tolerance, but is within an additional +/- 0.2 mm, the specimen may be tested but its non-compliance with the above tolerance is to be recorded.

    c. Locate and identify the center of the machined surface.

21. Verify hardness tester accuracy by performing hardness testing on calibration block.

a. Hardness results performed on the calibration block must be within the limits specified on the calibration block.

b. If the machine is not in calibration do not continue, and calibrate machine accordingly.

22. Perform hardness test in accordance with JIS C standard at the center of the machined surfaces. Five (5) separate and discrete tests are to be done at the center of each of the machined surfaces.

23. Record each of the (five) 5 measurements, for each side, and determine and record an average of the (five) 5 measurements, for each side. Each data point is to be recorded.

24. Determine and record a core hardness average by calculating an average based on the averages from each respective milled surfaces.

25. Store the tested specimen in a sealed, evacuated container/package so as to limit exposure to the atmosphere, and place with the remaining ball components from the golf ball tested.

26. Using the determined average hardness at 5 mm within the surface of each core calculate the standard deviation of the averages.

CORE CENTER HARDNESS:

This test is required to be performed on all NXT, DT So/Lo, Pinnacle Exception and Pro V1 golf balls. The core hardness test method is in accordance with JIS K6301 – Physical Testing Methods for Testing Vulcanized Rubbers and JIS K6253 – Hardness Testing Methods for Rubber, Vulcanized or Thermoplastic, unless otherwise specified.

BALLS: Pro V1, Pro V1x, Pro V1*, NXT, DT So/Lo, and Exception

27. Repeat Steps 1 through 6 above on randomly selected golf balls; OR

a. For NXT, NXT Tour, DT So/Lo and Pinnacle Exception golf balls, it is possible to use the twelve (12) cores from Steps 1-11.[1]

ONCE THE FOLLOWING MACHINING PROCESS BEGINS ALL OF THE FOLLOWING HARDNESS PROTOCOL FOR CORE CENTER HARDNESS MUST BE COMPLETED WITHIN 24 HOURS.

[1] For Pro V1 model golf balls the protocol for Core Hardness Distribution may be conducted first, followed by the protocol for measuring core center hardness.

28. Using the Bridgeport, or comparable, end-mill machine, machine off the section of the core selected for removal to a depth within 0.3 to 0.4 mm above the calculated center of the core.

    a. The entire depth of removed material should not be machined off in one pass, but a plurality of passes not exceeding a depth of 1 mm is to be used.

    b. A cutting head and cutting speed must be used to minimize burrs and heat generation during the machining process.

    c. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

29. To reach the final depth of the core center, the machined surface is to be buffed with no GREATER than 220 grit sandpaper, or comparable abrasive, to provide smooth surface free of machining marks and/or grooves. The buffing step must be done at a slow speed to minimize heat generation at the surface of the core, and a depth of no more than 0.05 mm for any one pass.

    a. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

30. Locate and identify the center of the machined surface.

31. Record the new ball diameter.

32. The tolerance of the center of the core is +/- 0.2 mm. If the amount of removed material is within this tolerance, the test may proceed.

33. Verify hardness tester accuracy by performing hardness testing on calibration block.

    a. Hardness results performed on the calibration block must be within the limits specified on the calibration block.

    b. If the machine is not in calibration do not continue, and calibrate machine accordingly.

34. Perform hardness test in accordance with JIS C standard at the center of the machined surface. Five (5) separate and discrete tests are to be done at the center of the machined surface.

35. Record each of the (five) 5 measurements and determine and record an average of the (five) 5 measurements.

36. Store the remaining core section in a sealed, evacuated container/package so as to limit exposure to the atmosphere, and place with the remaining ball components from the golf ball tested.

    a. The cores of the Pro V1 model golf balls may be used in the following protocol for CORE HARDNESS DISTRIBUTION. If this is done the CORE HARDNESS DISTRIBUTION test must be done within 24 hours of exposure of the center of the core.

37. Using the determined average hardness at the center of the core calculate the standard deviation of the averages.

CORE HARDNESS GRADIENT:

This test is required to be performed on all Pro V1 and Pro V1x[2] model golf balls and is not to be performed on any of the NXT, NXT Tour, DT So/Lo, and Pinnacle Exception golf balls. The core hardness test method is in accordance with JIS K6301 – Physical Testing Methods for Testing Vulcanized Rubbers and JIS K6253 – Hardness Testing Methods for Rubber, Vulcanized or Thermoplastic, unless otherwise specified.

BALLS: Pro V1 and Pro V1x

PRO V1

38. For **Pro V1** model golf balls, using the calculated diameter of the core from Steps 1 through 6, calculate the core radius and divide the radius into three (3) equidistant sections, which identifies two (2) evenly spaced points between the core center and the core surface along a single radial line to the surface.

    a. Record the core radius and measurement for the equidistant sections.

    b. Each of the evenly spaced points represent measurement depths for the core hardness distribution. The outermost point is the first measurement depth and the innermost point (not the center) is the second measurement point.

39. The core surface hardness is to be measured and recorded in accordance with the Core Surface Hardness protocol, set forth above.

40. Select a portion of the core to be removed, and mark the surface of the core.

41. Mount the core on a platen surface of a Bridgeport, or comparable, end-mill machine, using a mounting structure which minimizes squeeze of the core, while maintaining the core in a fixed position. The area marked in Step 40 shall be facing vertically and represent the highest point on the core's circumference.

[2] The protocol for the Pro V1x is different from that of the Pro V1, as set forth herein.

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ONCE THE FOLLOWING MACHINING PROCESS BEGINS ALL OF THE FOLLOWING HARDNESS PROTOCOL MUST BE COMPLETED WITHIN 24 HOURS.

42. Using the Bridgeport, or comparable, end-mill machine, machine off the section of the core selected for removal to a depth of 0.3 to 0.4 mm above the first measurement depth of the core.

    a. The entire depth should not be machined off in one pass, but a plurality of passes in which a set depth of material is removed in each pass. As the desired cut depth approaches each pass should not exceed a depth of more than 1 mm to ensure accuracy.

    b. A cutting head and cutting speed must be used to minimize burrs and heat generation during the machining process.

    c. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

43. To reach the final depth of the first measurement depth, the machined surface is to be buffed with no GREATER than 220 grit sandpaper, or comparable abrasive, to provide smooth surface free of machining marks and/or grooves. The buffing step must be done at a slow speed to minimize heat generation at the surface of the core, and a depth of no more than 0.05 mm for any one pass.

    a. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

44. Locate and identify the center of the first measurement surface and mark the center

45. Record the new ball diameter.

    a. The tolerance of the first measurement surface is +/- 0.2 mm. If the amount of material removed is within this tolerance, the test may proceed.

46. At a position 180 degrees from the first measurement surface, create the second measurement surface (from the results in Step 38b) repeating Steps 42 through 44 above.

47. Locate and identify the center of the second measurement surface and mark the center.

48. Record the new ball diameter.

    a. The tolerance of the second measurement surface is +/- 0.2 mm. If the amount of material removed is within this tolerance, the test may proceed.

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49. Verify hardness tester accuracy by performing hardness testing on calibration block.

    a. Hardness results performed on the calibration block must be within the limits specified on the calibration block.

    b. If the machine is not in calibration do not continue, and calibrate machine accordingly.

50. Perform hardness test in accordance with JIS C standard at the center of the two machined measurement surfaces. Five (5) separate and discrete tests are to be done at the center of the machined surface.

51. Record each of the five (5) measurements and determine and record an average of the (five) 5 measurements.

52. If the core center hardness is to be determined, proceed to the Core Center Hardness protocol and complete the core center hardness test.

53. Using the determined average hardness on each of the measurement surfaces, calculate the standard deviation of the averages for each of the respective measurement surfaces.

PRO V1x

54. For **Pro V1x** model golf balls, using the calculated diameter of the core from Steps 1 through 6, calculate the core radius.

    a. Record the core radius.

    b. For the purposes of measuring the hardness distribution of the Pro V1x golf balls, the depths of measurement are laid out below:

        i. First measurement depth is 3.5 mm from the core surface.

        ii. Second measurement depth is at the surface of the center portion of the core (i.e. gray color portion in model ◄ Pro V1x-332 ► and blue color portion in model ◄●Pro V1x 332●►).[3]

        iii. Third measurement depth is at 6.4 mm below the second measurement depth.

[3] The target diameter of the core is 1.55 inches whereas the target diameter of the inner portion of the core is 1.0 inches. Accordingly, the third measurement depth is approximately 7.0 mm below the surface of the core.

iv. Fourth measurement depth is at the center of the inner portion of the core, determined based on the calculated radius of the core.

55. The core surface hardness is to be measured and recorded in accordance with the Core Surface Hardness protocol, set forth above.

56. Select a portion of the core to be removed, and mark the surface of the core.

57. Mount the core on a platen surface of a Bridgeport, or comparable, end-mill machine, using a mounting structure which minimizes squeeze of the core, while maintaining the core in a fixed position. The area marked in Step 56 shall be facing vertically and represent the highest point on the core's circumference.

ONCE THE FOLLOWING MACHINING PROCESS BEGINS ALL OF THE FOLLOWING HARDNESS PROTOCOL MUST BE COMPLETED WITHIN 24 HOURS.

58. Using the Bridgeport, or comparable, end-mill machine, machine off the section of the core selected for removal to a depth of 0.3 to 0.4 mm above the first measurement depth of the core.

    a. The entire depth should not be machined off in one pass, but a plurality of passes in which a set depth of material is removed in each pass. As the desired cut depth approaches each pass should not exceed a depth of more than 1 mm to ensure accuracy.

    b. A cutting head and cutting speed must be used to minimize burrs and heat generation during the machining process.

    c. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

59. To reach the final depth of the first measurement depth, the machined surface is to be buffed with no GREATER than 220 grit sandpaper, or comparable abrasive, to provide smooth surface free of machining marks and/or grooves. The buffing step must be done at a slow speed to minimize heat generation at the surface of the core, and a depth of no more than 0.05 mm for any one pass.

    a. At least 10 seconds should elapse between each machining pass to allow for heat dissipation.

60. Locate and identify the center of the first measurement surface and mark the center.

61. Record the new ball diameter.

a. The tolerance of the first measurement surface is +/- 0.2 mm. If the amount of material removed is within this tolerance, the test may proceed.

62. At a position 180 degrees from the first measurement surface, create the second measurement surface repeating Steps 58 through 59 above.

63. Locate and identify the center of the second measurement surface and mark the center.

64. Record the new ball diameter.

a. The tolerance of the second measurement surface is +/- 0.1 mm. If the amount of material removed is within this tolerance, the test may proceed.

65. Verify hardness tester accuracy by performing hardness testing on calibration block.

a. Hardness results performed on the calibration block must be within the limits specified on the calibration block.

b. If the machine is not in calibration do not continue, and calibrate machine accordingly.

66. Perform hardness test in accordance with JIS C standard at the center of the first two measurement surfaces. Five (5) separate and discrete tests are to be done at the center of the machined surface.

67. Record each of the (five) 5 measurements and determine and record an average of the (five) 5 measurements.

68. Machine the second measurement surface to the third measurement surface following the same procedures set forth above in Steps 58 - 61.

69. Perform hardness test in accordance with JIS C standard at the center of the machined surface of the third measurement surface. Five (5) separate and discrete tests are to be done at the center of the machined surface.

70. Record each of the (five) 5 measurements and determine and record an average of the (five) 5 measurements.

71. For the fourth measurement surface (core center hardness), proceed to the Core Center Hardness protocol and complete the core center hardness test.

72. Using the determined average hardness on each of the measurement surfaces, calculate the standard deviation of the averages for each of the respective measurement surfaces.

EXHIBIT 12

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY

EXHIBIT 13

THIS EXHIBIT HAS BEEN REDACTED IN ITS ENTIRETY